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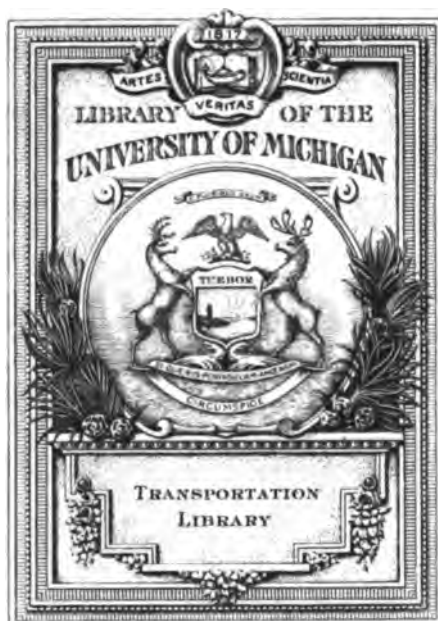
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THE ENGINEERING
INDEX ANNUAL-1918





THIRTY-FIFTH YEAR

THE
ENGINEERING INDEX
ANNUAL
FOR
1918

COMPILED FROM THE ENGINEERING INDEX, PUBLISHED MONTHLY, IN
INDUSTRIAL MANAGEMENT DURING 1918

TRANSPORTATION INDEX



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GUIDE TO THE INDEX

WITH this volume of The Engineering Index—the seventeenth since the work was first undertaken, and the thirteenth since it assumed the “Annual” form—a continuous index to the engineering literature of the past 35 years is made available. The classified system of arranging the items continues to be used, this being more satisfactory than the “strict alphabetical” order used in the early volumes.

This volume comprises eight divisions, as follows:

- | | |
|---------------------------------|---------------------------------|
| 1. Civil Engineering | 5. Mechanical Engineering |
| 2. Electrical Engineering | 6. Mining and Metallurgy |
| 3. Industrial Management | 7. Railway Engineering |
| 4. Marine and Naval Engineering | 8. Street and Electric Railways |

Each division has a number of sections, enumerated at the head of the division, and each section has a large number of headings under which the individual references are arranged. The names of all sections and headings are in alphabetical order in each division.

As an additional convenience to the user, a complete list of all headings and their page numbers in the book is given under the proper division and section, beginning with page 9. The user searching for a given item will save time by consulting first this list, which will assist him in locating at once the section, probable heading and corresponding page number.

The references in this index give always the original title of the article in the original language; the serial number used for ordering copies; the author's name, if any; whether the article is illustrated or not; the number of pages or words; the abbreviated name of the publication and its date of issue. If it is a serial article, extending over a number of issues, it is so indicated, but as a rule an article is indexed only on its first appearance, because sufficient for locating. In some instances the various installments of an article are listed.

The Index for 1918 comprises about 250 of the more important technical journals, the greater percentage in the English language. During the European war, 1914 to 1918, a large number of foreign publications did not reach the United States and could not be indexed in this volume; those coming to hand later are likely to be found in succeeding volumes. With every entry a brief descriptive note is given defining the scope and purport of the article, in some cases sufficient for the purpose of the investigator and saving him the labor of further search. In general, however, the Index is used as a guide to the otherwise overwhelming mass of information contained in the huge files in engineering periodicals stacked on the shelves of reference libraries throughout the world.

The present work represents the continuation of that originally started by Professor J. B. Johnson in the Journal of The Association of Engineering Societies which covered 1884 to 1895, and turned over by that Association to the Engineering Magazine Company at the close of 1895. This company continued and enlarged the work, and after 1905 published the INDEX as an Annual.

At the close of 1918 it was deemed advisable to eliminate duplication by incorporating this INDEX with the more complete “Selected Titles of Engineering Articles” appearing in The Journal of The American Society of Mechanical Engineers, which covers at the present time about 1100 important technical publications received in the Engineering Societies Library.

Beginning with January, 1919, the INDEX will appear in MECHANICAL ENGINEERING, THE JOURNAL OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS, the monthly lists being combined at the end of the calendar year in The Engineering Index Annual, which will be more comprehensive than the 1918 and earlier volumes by virtue of the greater number of journals indexed and the larger staff of trained compilers than were heretofore possible.

COPIES OF LETTERS CERTIFYING THE TRANSFER OF OWNERSHIP OF THE ENGINEERING INDEX

Letter written by Calvin W. Rice, Secretary of The American Society of Mechanical Engineers, to John R. Dunlap, Editor and Proprietor of INDUSTRIAL MANAGEMENT:

Dear Mr. Dunlap:

Nov. 29, 1918.

You have built up a distinctive service known as "The Engineering Index." You can be proud of the achievement. The Society in acquiring it, pledges to carry it on in the same spirit.

We will bring to the "Index" the facilities of the extensive Engineering Societies Library, the combined library of five great Societies, embracing over eleven hundred leading current engineering publications of all countries, and a reviewing staff of engineers specializing in bringing together the world's technical literature for a single subscription.

We propose to furnish this as an added service to all the members of The American Society of Mechanical Engineers.

We accept your offer to assist us by your advice and counsel in taking over the "Index," extending it, and making it the most complete in the world.

Yours truly,

CALVIN W. RICE.

Letter written by John R. Dunlap to the Secretary of The American Society of Mechanical Engineers:

Dear Mr. Rice:

Nov. 30, 1918.

Thank you for your kind favor of the 29th instant in relation to taking over THE ENGINEERING INDEX.

After having devoted more than 35 years to developing and maintaining that indispensable and priceless publication, I can promise you that engineers and specialists in every state in our Union—and indeed in every quarter of the civilized world—will welcome the glad news that your Society has taken over this great work, and you are now definitely pledged to maintain and extend its invaluable service.

I have always found such ready and widespread appreciation of the INDEX, and especially its Clipping Bureau Service, that I have never had any difficulty in making it pay its way—directly for the annual volumes, and indirectly for the monthly issues. Now that the publication will carry the official endorsement of your great Society, and now that you can enlist the active interest of all your members and in addition make an effective appeal for support to members of all the other great engineering societies, I confidently predict that ere long you will find it advisable to issue the INDEX as a separate monthly publication, precisely as we long ago found it necessary to publish it as an Annual.

Wishing you every success in the future development of the Work, and assuring you of the cordial and continuous co-operation of myself and every member of our staff, I am,

Sincerely yours,

JOHN R. DUNLAP.

REFERENCE LIST OF PERIODICALS

Alphabetical List of Periodicals Indexed in Order of Their Abbreviations

ABBREVIATION	TITLE	ISSUES PER YEAR	PLACE OF PUBLICATION
AA	Aerial Age Weekly	52	New York
AA P C M	Assn. Amer. Portland Cement Mfra.	Irreg.	Philadelphia
AB M A	American Boiler Manufacturers' Associat'n	1	Cleveland
A C S	American Chemical Society	12	Easton, Pa
A E R	American Economic Review	12	Princeton
A E R A	American Electric Railway Association	12	New York
A E S	Assn. Engineering Societies	12	St. Louis
A E I S	American Electrochemical Society	Irreg.	So. Bethlehem
A F A	Amer. Foundrymen's Assn.	Irreg.	Cleveland
A I & S I	Amer. Iron & Steel Institute	12	New York
A I C E	Amer. Institute of Chemical Engineers	Irreg.	New York
A I E E	Amer. Institute of Elec. Engineers	12	New York
A I M E	Amer. Institute of Mining Engineers	12	New York
A I M t	Amer. Institute of Metals	Irreg.	Buffalo
A I S E E	Assn. Iron & Steel Elec. Engrs.	1	Pittsburgh
A J I P H	Amer. Journal of Public Health	12	Boston
A J I S	Amer. Journal of Science	12	New Haven
A M S	Australian Mining Standard	52	Sydney
A P S	American Peat Society	4	Toledo, O
A R	Architectural Record	12	New York
A R B A	Amer. Road Builders' Assn.	Irreg.	New York
A R B & B A	Amer. Ry. Bridge & Bldg. Assn.	Irreg.	Chicago
A R E A	Amer. Ry. Engineering Assn.	10	Chicago
A R M M A	Amer. Ry. Mas. Mech. Assn.	1	Chicago
A S	Applied Science	12	Toronto
A S C E	Amer. Soc. of Civil Engineers	10	New York
A S H V E	Amer. Soc. of Heat. & Vent. Engineers	4	New York
A S M D	Amer. Soc. of Marine Draftsmen	4	Washington
A S M E	Amer. Soc. of Mechanical Engineers	12	New York
A S N E	Amer. Soc. of Naval Engineers	4	Washington
A S R E	Amer. Soc. of Refrig. Engineers	6	New York
A S T M	Amer. Soc. Testing Materials	1	Philadelphia
A T C A O	Assn. of Trans. & Car Acct. Officers	2	New York
A W P A	Amer. Wood Preserv. Assn.	Irreg.	Baltimore
A W W A	Amer. Water Works Assn.	4	Baltimore
A & B	Architecture & Building	12	New York
A c r	Autocar	52	New York
A e	Aera	12	London
A e r n	Aeronautics	52	London
A m M a c h	American Machinist	52	New York
A n n d P t e t C h	Annales des ponts et chaussées	12	Paris
A u t	Automobile	52	New York
B C B M	British Columbia Bureau Mines	Irreg.	Victoria
B C B u l	Barge Canal Bulletin	12	Albany
B E C	Brooklyn Engineers' Club	1	Brooklyn
B F & S P	Blast Furnace & Steel Plant	12	Pittsburgh
B M	Boiler Maker	52	New York
B P	Boletín de Petróleo	12	Mexico
B R & S	Better Roads & Streets	12	Jamestown, O.
B S C E	Boston Soc. of Civil Engineers	10	Boston
B W	Brass World & Platers' Guide	12	New York
B k b l d	Brickbuilder	12	Boston
B u l T a y l o r S o c	Bulletin of the Taylor Society	4	Hanover, N. H.
C A M	Compressed Air Magazine	12	New York
C C E	Cornell Civil Engineer	8	Ithaca
C D M	Canada Department of Mines	Irreg.	Ottawa
C E M	Cassier's Engineering Monthly	12	London

REFERENCE LIST OF PERIODICALS

ABBREVIATION	TITLE	ISSUES PER YEAR	PLACE OF PUBLICATION
C E S St P	Civil Engineers' Soc., St. Paul	1	St. Paul
C G	Colliery Guardian	52	London
C I A At	Atti. Colleg. Ingegneri ed Arch.	12	Milan
C M I	Canadian Mining Institute	12	Montreal
C M J	Canadian Mining Journal	24	Toronto
C M M S S A	Chem. Met. & Min. Soc. of South Africa	12	Johannesburg
C M W A	Chamber of Mines of West Australia	12	Kalgoorie
C R C	Central Railway Club	6	New York
C S C E	Canadian Soc. of Civil Engineers	Irreg.	Montreal
C S M M	Colorado School of Mines Magazine	12	Golden
C U Q	Columbia University Quarterly	4	New York
C V	Commercial Vehicle	24	New York
C I A	Coal Age	52	New York
C n E	Canadian Engineer	52	Toronto
C n r	Contractor	24	Chicago
C n t	Contracting	12	Detroit
C r t	Concrete	12	New York
C w E	Commonwealth Engineer	12	Melbourne
D W P B	Dominion Water Power Branch, Dept. Int.	Irreg.	Ottawa
E C D	Engineers' Club of Dayton	Irreg.	Dayton
E C P	Engineers' Club of Philadelphia	4	Philadelphia
E C St L	Engineers' Club of St. Louis	6	St. Louis
E G	Economic Geology	8	New Haven
E S P	Engineers' Soc. of Pennsylvania	12	Harrisburg
E S W P	Engineers' Soc. of West. Pennsylvania	10	Pittsburgh
E & C	Engineering & Contracting	52	Chicago
E & M J	Engineering & Mining Journal	52	New York
E l A	Electrical Age	12	New York
E l J	Electric Journal	12	Pittsburgh
E l n	Electrician	52	London
E l R	Electrical Review	52	London
E l R & W E	Electrical Review & West. Electrician	52	Chicago
E l R J	Electric Railway Journal	52	New York
E l T	Electric Traction	12	Chicago
E l W	Electrical World	52	New York
Eng	Engineering	52	London
Eng News-Rec	Engineering News-Record	52	New York
Enr	Engineer	52	London
F I J	Franklin Institute Journal	12	Philadelphia
Flight	Flight	52	London
Fly	Flying	12	New York
F n d	Foundry	12	Cleveland
G E R	General Electric Review	12	Schenectady
G R	Good Roads	12	New York
G n C v	Génie Civil	52	Paris
H A	Horseless Age	24	New York
H & V M	Heating & Ventilating Magazine	12	New York
I A	Iron Age	52	New York
I C E	Institution of Civil Engineers	Irreg.	London
I C E I	Institution Civil. Engineers of Ireland	1	Dublin
I E E	Institution of Electrical Engineers	Irreg.	London
I E S S	Instn. Engrs. & Shpbldrs. of Scotland	Irreg.	Glasgow
I F	L'Ingegneria Ferroviaria	24	Rome
I I Bul	Bulletin of the Imperial Institute	4	London
I M E	Institution of Mining Engineers	Irreg.	London
I M M	Institution of Mining & Metallurgy	Irreg.	London
I M ch E	Institution of Mechanical Engineers	Irreg.	London
I M r E	International Marine Engineering	12	New York
I S C A M A	Iowa State Col. & Agri. & Mech. Arts	4	Ames
I S E	Institute of Sanitary Engineers	12	London
I T R	Iron Trade Review	52	Cleveland
I & C T R	Iron & Coal Trades Review	52	London
I & R	Ice & Refrigeration	12	Chicago

REFERENCE LIST OF PERIODICALS

7

ABBREVIATION	TITLE	ISSUES PER YEAR	PLACE OF PUBLICATION
Ind Eng Soc	Indiana Engineering Society	1	Indianapolis, Ind
Ind	L'Industria	52	Milan
Ind Man	Industrial Management	12	New York
Ing	Ingenieur	52	The Hague
Inst Aut Engrs	Institute Automobile Engineers	12	New York
Ir & St Inst	Iron & Steel Institute	2	London
Jl Act	Journal of Accountancy	12	New York
Jl G	Journal of Geology	8	Chicago
Jl Ind & Eng Chem	Journal of Industrial and Engineering Chemistry	12	New York
K A E	Keighly Assn. of Engineers	Irreg.	Keighly
L S M I	Lake Superior Mining Institute	1	Superior
La Nt	La Nature	52	Paris
M A E	Manchester Assn. of Engineers	Irreg.	Manchester
M B M A	Master Boiler Makers' Assn.	1	New York
M C B A	Master Car-Builders' Association	1	New York
M E & N A	Marine Engineer & Naval Architect	12	London
M I	Metal Industry	12	New York
M J I	Mining Journal	52	London
M M S A	Mining & Metallurgical Soc. of Amer.	12	New York
M Mg	Mining Magazine	12	London
M Rv	Marine Review	12	Cleveland
M & C E	Metallurgical & Chemical Engineering	24	New York
M & E R	Mining & Engineering Review	12	Melbourne
M & E W	Mining & Engineering World	52	Chicago
M & S P	Mining & Scientific Press	52	San Francisco
Mch E	Mechanical Engineer	52	Manchester
Mch	Machinery	12	New York
Mch W	Mechanical World	52	Manchester
Mich Eng Soc	Michigan Engineering Society	1	Ann Arbor, Mich
Mfrs Rec	Manufacturers' Record	52	Baltimore
Min & Sci Pr	Mining & Scientific Press	52	San Francisco
Mon Tec	Monitore Tecnico	36	Milan
Mun E	Municipal Engineering	12	Indianapolis
Mun E	Municipal Engineering	12	New York
Mun Eng N Y	Municipal Engineers of the City of New York, Proc	1	New York
Mun Eng N Y	Municipal Engineers' Journal	12	New York
N E	National Engineer	12	Chicago
N E C I E S	N-E Coast Instn. Engrs. & Shpbldrs.	Irreg.	New Castle
N E L A	National Electric Light Association, Proc.	1	New York
N E R A	New England Roadmasters' Assos., Proc.	1	Boston, Mass
N E R C	New England Railroad Club, Proc.	1	Boston, Mass
N E W W A	New England Water Works Assn.	4	Boston, Mass.
N F A Sf Bul	National Founders' Assn. Saf. Bulletin	12	West Lynn
N L M A	National Lime Manufacturers' Assn.	Irreg.	
N Y E S	New York Electrical Society, Tran	Irreg.	New York
N Y R C	New York Railroad Club	9	New York
Naut Gaz	Nautical Gazette	52	New York
Nt	Nature	52	London
O S M E S E	Ohio Soc. Mech., Elec. & Steam Engrs.	2	Columbus
P B S	Philippine Bureau of Science	Irreg.	Manila
P C An	Annales des Ponts et Chaussées	6	Paris
P E, C	Practical Engineer, Chicago	24	Chicago
P J I S	Philippine Journal of Science	6	Manila
P W I	Permanent-Way Institution	4	Beeston
Pwr	Power	52	New York
Q G M J I	Queensland Government Mining Journal	12	Brisbane
Qry	Quarry	12	London
R A G	Railway Age Gazette	52	New York
R C P	Railway Club of Pittsburgh	9	Pittsburgh
R E	Railway Engineer	12	London
R E & M W	Railway Engineering & Maint. of Way	12	Chicago

REFERENCE LIST OF PERIODICALS

ABBREVIATION	TITLE	ISSUES PER YEAR	PLACE OF PUBLICATION
R G	Railway Gazette	52	London
R G S	Revue generale des Sciences	24	Paris
R M	Rivista Marittima	12	Rome
R M E	Railway Mechanical Engineer	12	New York
R M M	Railway Master Mechanic	12	New York
R R	Railway Review	52	Chicago
R S A	Royal Society of Arts	52	London
R S E	Railway Signal Engineer	12	Chicago
R T	Resources of Tennessee	4	Nashville
R T C	Revue Trimestrielle Canadienne	4	Montreal
R U S I	Royal United Service Institution	4	London
R & L E	Railway & Locomotive Engineering	12	New York
S A E	Society of Automotive Engineers	12	New York
S B	Schweizerische Bauzeitung	52	Zurich
S C A A n	Anales de la Soc. Cientif. Argentina	6	Buenos Aires
S C I R y	Revista, Soc. Cubana de Ingenieros	12	Havana
S E	Society of Engineers	12	London
S E I N	Societe d'Encourag., Indus. Nation.	12	Paris
S E V	Schweizerische Elektrotechnische Verein	4	Zürich
S I	Stevens Indicator	4	Hoboken
S I A I A n	Annali, Soc., Ingeg. e Archit. Ital.	24	Rome
S I C F	Societe Ingenieurs Civils de France	Irreg.	Paris
S I E	Societe Internation. Electriciens	Irreg.	Paris
S J I E	Sibley Journal of Engineering	9	Ithaca
S L R C	St. Louis Railway Club	12	St. Louis
S M	Scientific Monthly	12	New York
S M C E	Surveyor & Municip. & County Engr.	52	London
S M Q	School of Mines Quarterly	4	New York
S N A M E	Soc. Naval Arch. & Mar. Engineers	Irreg.	New York
S P S M	Soc. to Promote Sci. of Management	6	Hanover
S R & M E	Sanitary Rec. & Municip. Engineer	52	London
S & I	Steel and Iron	12	Pittsburgh
S & S-W R C	Southern & Southwestern Railway Club	6	Atlanta
S f E	Safety Engineering	12	New York
T E	Telephone Engineer	12	Chicago
T E A	Traveling Engineers' Assn.	Irreg.	East Buffalo
T S	Travelers Standard	12	Hartford
T & R W	Tramway & Railway World	12	London
Times Eng. Supp	Times Engineering Supplement	12	London
Tel.	Telephony	52	Chicago
U E E S	Utah Engineering Experiment Station	Irreg.	Salt Lake City
U I	University of Illinois	Irreg.	Urbana
U M	University of Minnesota	Irreg.	Minneapolis
U M S M M	Univ. of Mo. School of Min. & Metall.	4	Rolla
U N P	Universidad Nacional de la Plata	Irreg.	La Plata
U S B M	U. S. Bureau of Mines	Irreg.	Washington
U S B S	U. S. Bureau of Standards	Irreg.	Washington
U S C & G S	U. S. Coast & Geodetic Survey	Irreg.	Washington
U S D A	U. S. Dept. of Agriculture	Irreg.	Washington
U S G S	U. S. Geological Survey	Irreg.	Washington
U S N I	U. S. Naval Institute	6	Annapolis
W E	Western Engineering	12	San Francisco
W G N H S	Wis. Geol. & Nat. Hist. Surv.	Irreg.	Madison
W P I J I	Jour. Worcester Polytechnic Institute	6	Worcester
W R C	Western Railway Club	10	Chicago
W S E	Western Soc. of Engineers		
Wis E	Wisconsin Engineer	9	Madison

CLASSIFICATION OF THE INDEX

TO THE USER: This classification should always be consulted, and the page number of the proper division ascertained, before looking for an item in the body of the book.

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Bridge Architecture

Abutments

Turning Back Abutment Wing Walls Saves Material (83776). Charles K. Mohler. Ills. 2000 w. Eng News-Rec—Jan. 24, 1918. Revising layout of straight wall abutments.

Bridge Abutment Has Pier Footings and Curved Wings (86444). Jonathon Jones. Ills. 1000 w. Eng News-Rec—May 23, 1918. Old creek bed necessitates special abutment and wing design for undergrade bridge.

Arch

Design and Construction of the Third Avenue, South, Concrete-Steel Arch Bridge, Minneapolis, Minn. (82883 A). Charles F. Bornefeld. Ills. 1000 w. Mun Eng—Dec., 1917. Plan of bridge partly curved having arches of two types. Features of interest.

Arch Design

The Design of a Three-Hinged Arch (85604 A). P. H. Chen. Ills. 12 pp. Corn C E—Feb., 1918. Investigation of the relative stiffness of steel arch ribs with three, two and no hinges.

See also same heading under Measurement.

Arches

The Economics of Steel Arch Bridges (89223 D). 1200 w. A S C E, Pro—Sept., 1918. Continued discussion of J. A. L. Waddell's paper.

The Economics of Steel Arch Bridges (89656 D). 13 pp. A S C E, Pro—Oct., 1918. Continued discussion of J. A. L. Waddell's paper.

The Economics of Steel Arch Bridges (85317 D). J. A. L. Waddell. Ills. 40 pp. A S C E, Pro—March, 1918. Aims to settle every important economic question that can arise in the designing of steel arches.

Grandes Voutes (83944 B). A. Bonnet. Ills. 2400 w. Le Génie Civil—Dec. 15, 1917. Well known arches of long span, in different countries.

Bascule

Illinois Central Bascule Bridge is Hand Operated (84243). Ills. 1000 w. Eng News-Rec—Feb. 14, 1918. Bridge near Allen, Miss., has plate-girder span fitted with counterweighted lifting truss.

Pont Basculant De 42 Mètres De Portée (87137 B). A. Goupil. Ills. 1800 w. Génie Civil—May 18, 1918. A bascule bridge recently built on Trollhättan Canal, Sweden, with lift span 137 ft. 9 in. long.

The 186 Foot Bascule Bridge of the C. & N. W. Ry., Over the North Branch of the Chicago River at Deering (87137 B). O. F. Dalstrom, with disc. Ills. 25 pp. West Soc Engrs, Jl—1917. Details of design and construction.

Bearings

New Details for Draw Span Bearings (84974). Ills. 900 w. Ry Age—March 15, 1918. Novel features of draw span over the Missouri river at Kansas City.

Bridge Architecture

Some Reflections on the Architecture of Bridges (83236). 1700 w. Eng & Con—Dec. 26, 1917. Translated and

Consult Classification of the Index. See page 9.

Bridge Testing

adapted from Séjourné's "Grandes Voutes," by D. B. Steinman. On the artistic design of bridges.

Bridge Testing

See same heading under Measurement.

Bridge Work

Bridge Work on the Hannibal Line Cut Off (82472). Ills. 1000 w. Ry Age Gaz—Nov. 16, 1917. Construction of a reservoir required the relocation of a part of the C., St. P., M. & O.

Cantilever

The Harahan Bridge at Memphis, Tennessee (82454 B). Ralph Modjeski. Ills. 16 pp. Fkn Inst, JI—Nov., 1917. Detailed description of this cantilever crossing the Mississippi.

Castleton

State Law Limits Castleton Bridge to Single Span (86617). 1500 w. Eng News-Rec—May 30, 1918. Act prohibits center pier for Hudson River bridge.

Concrete

Pennsylvania Specifications for Culverts and Short-Span Concrete Bridges (82249 A). 1500 w. Mun Eng—Nov., 1917. Essential clauses of recently adopted specifications.

Construction Features of Derby-Shelton Concrete Bridge (85206). Richard L. Saunders. Extracts from paper before Conn. Soc. of Civ. Engrs. Ills. 2000 w. Eng & Con—March 27, 1918. Details of work on bridge over the Housatonic River. Designed to meet conditions.

Decision of U. S. District Court of Iowa on Certain Luten Patents for Concrete Bridges (83849). 2800 w. Eng & Con—Jan. 23, 1918. Extracts from opinion of Judge Martin J. Wade.

Mount Pleasant Road Bridge, Toronto (83587). J. S. Burgoyne. Ills. 3000 w. Can Engr—Jan. 10, 1918. Reinforced concrete structure consisting of a pair of cantilever beams of arched form with a free joint at center.

Concrete-Arch Railway Bridge Costs Less Than Steel (84387). Ills. 2500 w. Eng News-Rec—Feb. 21, 1918. Double-track concrete structure replaces iron.

Concrete Arch

Foundations, Forms and Concrete Distribution Mark Bridge Construction (87499). Edward W. Stearns. Ills. 4000 w. Eng News-Rec—July 11, 1918. Coffer dam leakage presents problems in James River concrete arch bridge, at Richmond, Va.

Concrete Flat Slab

Reinforced-Concrete Flat-Slab Railway Bridges (87251). A. B. Cohen. Ills. 3500 w. Can Engr—June 27, 1918. Read before Am. Concrete Inst. On

BRIDGES**Flat Slab**

the development and utility of the flat-slab system.

Concrete Slabs

Precast Bridge Slabs of Concrete Incased I-Beams (84924). Ills. 2000 w. Eng News-Rec—March 14, 1918. Chicago & Northwestern Railway uses new type of overcrossing.

Concrete Trestles

Reinforced Concrete Trestles at North Toronto (88248). Ills. 1500 w. Ry Age—Aug. 16, 1918. Details developed in viaducts designed as a substitute for steel construction.

Construction

Architecture and Construction of Bridges (89596 A). Charles Evan Fowler. 10 pp. N Y Rd Cb, Pro—Sept. 20, 1918. Reviews the progress of design and the accomplishment in span girder and in suspension and arch bridges; problems of erection, loadings, etc.

Design

Continuous Trusses of Silicon Steel Feature New Allegheny River Bridge (86041). Ills. 4500 w. Eng News-Rec—May 2, 1918. Departure from precedent in bridge design; minimum weight desired for economy and to facilitate cantilever erection.

Esthetics in Bridge Design (86352). J. A. L. Waddell. Ills. 3300 w. Ry Rev—May 18, 1918. From a paper in *The American City*, N. Y. Beauty and harmony.

Double-Deck

Double Deck Railway Bridge Over Kansas River With Thin Floor Construction (84797). F. W. Epps. Ills. 2000 w. Eng News-Rec—March 7, 1918. Details of bridge on new west entrance route.

Draw Bridge

Unusual Failure of a Railroad Draw Bridge (84971). Ills. 900 w. Ry Age—March 15, 1918. Train pushed the span off the pier at one end, causing it to tip down into the river.

Earthquake Damage

Guatemala Earthquake Shifts Steel Viaduct on Its Piers (86442). W. T. Penney. 1000 w. Eng News-Rec—May 23, 1918. Tower legs move several inches on their bases in different directions.

Erection

Problems and General Methods of Erecting the Sciotoville Bridge (83529). Clyde B. Pyle. Ills. 4000 w. Eng News-Rec—Jan. 10, 1918. Serial, 1st part. Original plan, with elimination of secondary stresses, in placing large two-span continuous structure over the Ohio River.

Flat Slab

The Advantages of Flat-Slab Construction for Bridges (88506). A. B. Cohen.

France

Ills. 2200 w. Eng & Con—Aug. 28, 1918. Statement of advantages; examples.

France

Bridge at Lyons Named in Honor of President Wilson (88481 A). Ills. 700 w. Eng News-Rec—Aug. 29, 1918. Arch structure with twin masonry ribs carrying reinforced-concrete floor peculiar to French design. See Wilson Bridge.

Hardinge

The Hardinge Bridge at Sara (83928). Ills. 2400 w. Times Eng Supp—Nov. 30, 1917. New structure for railway over the Ganges river.

Hell Gate

The Hell Gate Arch Bridge and Approaches of the New York Connecting Railroad Over the East River in New York City (88731 D). 3000 w. A S C E, Pro—Aug., 1918. Continued discussion of the paper by O. H. Ammann.

Stress Measurements on the Hell Gate Arch Bridge (88732 D). 30 pp. A S C E, Pro—Aug., 1918. Continued discussion of D. B. Steinman's paper.

The Hell Gate Arch Bridge and Approaches of the New York Connecting Railroad Over the East River in New York City (85923 D). 1000 w. A S C E, Pro—April, 1918. Continued discussion of O. H. Ammann's paper.

The Hell Gate Arch Bridge and Approaches of the New York Connecting Railroad Over the East River in New York City (85319 D). Ills. 11 pp. A S C E, Pro—March, 1918. Continued discussion of O. H. Ammann's paper.

Highway

Recommended Practice in Design and Construction of Permanent Highway Bridges of Concrete and Steel (89400 A). John W. Towle. 2000 w. Mun Eng—Oct., 1918. From address before N. C. Good Roads Assn. Types in use; building and maintenance.

Highway Bridges

Recent Reinforced Concrete Highway Bridge Work in Ontario (87202). Ills. 1000 w. Eng & Con—June 26, 1918. From paper of G. Graham Reid, describing types.

Hudson Bay

Difficult Bridge Construction in a Cold Country (86847). W. Chase Thomson. Ills. 3500 w. Ry Age—June 14, 1918. Hudson Bay railway trusses over Kettle Rapids are continuous over four supports.

India

On the Physical Features of "Adam's Bridge" and the Currents Across It, Considered as Affecting the Proposed Construction of a Railway Connecting

BRIDGES

Military Bridges

India with Ceylon (87466 N). Francis John Waring, with abstract of discussion. Ills & Maps. 50 pp. Instn C E, Pro—Jan. 23, 1917. Methods proposed for carrying out the connection with the mainland.

Keadby

Keadby Bridge (87466 N). James Benjamin Ball, with abstract of discussion. Ills. 90 pp. Instn C E, Pro—Nov., 1916. A combined railway- and road-bridge of five spans. The lifting span is worked electrically.

Signalling and Interlocking of Keadby Deviation Railway and Bridge (87472 N). James Benjamin Ball. Ills. 25 pp. Instn C E, Pro—Paper No. 4199, Detailed description.

Kettle Rapids

Nelson River Crossed by Hudson Bay Railway on Large Continuous-Truss Bridge (88478 A). Ills. 3000 w. Eng News-Rec—Aug. 29, 1918. Cantilever erection of 400-ft. span made necessary.

Kettle Rapids Bridge (85810). W. Chase Thomson. Ills. 3500 w. Can Eng—April 18, 1918. Details of Canadian bridge over the Nelson River. Design and construction.

Long Plate-Girder

New York Central Sets Long Plate Girder in Bridge (83208). Ills. 700 w. Eng News-Rec—Dec. 27, 1917. Complicated West Shore crossing near New Durham, N. J. Two wrecking cranes place 105-ton member, 131½ ft. long.

Long Spans

Economics of Long-Span Bridges (86801). Charles Evan Fowler. 3000 w. West Eng—June, 1918. Considerations that govern selection of site, length of span, and type of bridge.

Manayunk, Pa.

New Pennsylvania Railroad Bridge at Manayunk, Pa. (84200). Albert M. Wolf. Ills. 1800 w. Ry Rev—Feb. 9, 1918. Design and methods of construction.

Metropolis Bridge

Designing the 720-Foot Metropolis Span (83092). Ills. 2500 w. Eng News-Rec—Dec. 20, 1917. Details of span of Ohio River bridge.

Military Bridges

The Marcille and Henry Types of Military Bridges in France (86606). A. Bidault des Chaumes, in *Le Genie Civil*. Ills. 1500 w. Eng & Con—May 29, 1918. Types, and methods of erection.

Bridge Training of a Battalion of Mounted Engineers (85071 B). Ills. 2500 w. Prof Mem—March-April, 1918. Report of instruction given in various types of bridges.

BRIDGES

Steel

Moving

Shifting a 4000-Ton Bridge on Freight Car Trucks (84269). Ills. 2000 w. Ry Age—Feb. 15, 1918. Three spans of St. Joseph & Grand Island structure over the Missouri River moved 136 ft.

Ohio River

The Sciotoville Bridge (84282 A). Frank W. Skinner. Ills. and Plate. 3500 w. Engng—Jan. 25, 1918. Serial, 1st part. Details of bridge across the Ohio River at a height of 110 ft. above low water.

Pier-Foundations

Method of Extending Pier-Foundations of the Wanganui Bridge (87920). Robert W. Holmes. Ills. 1000 w. Eng & Con—July 31, 1918. Details of work in New Zealand.

Piers

Method of Constructing and Sinking Floating Caisson for a Bridge Pier (85705). U. W. Mayo, in Qr. Bul. of Bur. of Pub. Wks., Manila. 2500 w. Eng & Con—April 17, 1918. Used in construction of Jones bridge over the Pasig River in the City of Manila, P. I.

Portland, Me.

Draw Pier of Portland Bridge Settles Three Feet (89127 A). 1200 w. Eng News-Rec—Sept. 26, 1918. Out of service temporarily by sinking of concrete pier resting on piles.

Poughkeepsie

Strengthening Poughkeepsie Bridge Superstructure (88811). Ills. 2500 w. Ry Age—Sept. 13, 1918. Gauntlet track operation will permit heavier loading.

Protection

Methods of Protecting Steel Work of Marshall Ave. Bridge, St. Paul, from High Water (83237). Ills. 800 w. Eng & Con—Dec. 26, 1917. Explains conditions and methods of protection used.

Quebec

Expansion Joints and Traction Trusses, Quebec Bridge (84191). Archibald John Meyers. Ills. 4500 w. Can Engrs—Feb. 7, 1918. Sliding rail expansion joints allow motion of $17\frac{1}{2}$ inches between suspended span and each cantilever arm.

The Quebec Bridge (84844 A). Ills. 2500 w. Engr—Feb. 15, 1918. Review of the undertaking and its accomplishment.

The New Quebec Bridge (89328 A). Ills. and Plates. 4500 w. Engng—Sept. 13, 1918. Account of its erection.

Erection of the Suspended Span of the Quebec Bridge (82560 A). Ills. 1500 w. Engr—Nov. 2, 1917. Serial, 1st part. Detailed account of this important engineering feat.

The Quebec Bridge (82375 A). Ills. 1300 w. Engng—Oct. 26, 1917. Reviews the history of the bridge and its successful completion.

Rebuilding

Rebuilding the C. B. & Q. R. R. Bridge Over the Platte River, Near Grand Island, Neb. (87844). Ills. 900 w. Ry Rev—July 27, 1918. Interesting features of the work.

Bethlehem Ore Bridge Built in 65 Days (88309 A). Ills. 700 w. Iron Age—Aug. 22, 1918. Rapid reconstruction of structures of the Bethlehem Steel Co., replacing two destroyed by a violent storm.

Reconstruction

Rapid Reconstruction of Stone Masonry Bridges by Use of Metal Frames and Concrete (86608). From *Ann. des Ponts et Chaussées*. Ills. 1800 w. Eng & Con—May 29, 1918. Outlines method used for rebuilding after battle of the Marne.

River Crossings

River Crossings (87839 B). Ills. 34 pp. Prof Mem—July-Aug., 1918. Extracts from "Tactics and Technique of River Crossings," by General Mertens (German Army).

Roller Lift

Keadby Railway and Highway Scherzer Roller Lift Bridge (82553 A). Ills. & Plates. 6000 w. Engng—Nov. 2, 1917. Serial, 1st part. Details of an interesting bridge having the largest roller lift span yet built.

Russia

Bridge Across the River Vistula at Warsaw (88399 A). Ills. 800 w. Engr—July 26, 1918. Brief description of a recently completed bridge at the capital of Russian Poland. Built on the three-ointed arch system.

Salem Bridge

Twenty-four Designs for Salem Bridge Wasted Before Commissioners Agreed (82311). Ills. 1500 w. Eng News-Rec—Nov. 8, 1917. Contract let after three years. Public loses by delay because of rising prices.

Skew Bridges

Skew Subway Bridges Require Special Design (88959 A). Ills. 1000 w. Eng News-Rec—Sept. 19, 1918. Details of reinforced concrete structures on track-elevation work in Chicago.

Steel

General Specifications for Steel Highway Bridges, Ontario, 1917 (82322). E. H. Darling. 2500 w. Can Engr—Nov. 8, 1917. Analysis of the 1917 specifications showing many changes and improvements.

BRIDGES

Army Depot

Steel Arch

The Economics of Steel Arch Bridges (88737 D). Ills. 27 pp. A S C E, Pro—Aug., 1918. Continued discussion of J. A. L. Waddell's paper.

Swingbridge

Drum and Track Failure Endangers Important Swingbridge (85741). Ills. 1200 w. Eng News-Rec—April 18, 1918. Deterioration of bridge in New Jersey after seven years' service.

Switzerland

Ergebnisse der Untersuchung von Eisenbeton-Brücken der Schweiz-Bundesbahnen (85860 B). A. Bühler. Ills. 2000 w. Schweiz-Bauzeitung—Feb. 23, 1918. Critical study of various designs of reinforced concrete bridges of the Swiss Federated Railways.

Trestle

Reinforced Concrete Railway Trestle at Toronto (85935). Arthur F. Wells. Ills. 1000 w. Can Engr—Apr. 25, 1918. New 3-track structure. Premoulded concrete T-slabs rest on concrete bents supported on concrete spread footings.

Viaducts

Arched Steel Cantilevers Used in Park Avenue Viaduct (87502). Harry W. Levy. Ills. 1500 w. Eng News-Rec—July 11, 1918. A new viaduct under construction across 42d St., leading to an elevated roadway at Grand Central Terminal.

Concrete Viaduct at St. Louis Has Simple Details (86694). Charles W. Martin. Ills. 2000 w. Eng News-Rec—June 6, 1918. Structure carrying Chouteau Ave. over railroad made up of short slab spans on three post piers.

Road Along Rock and Shale Bluff Requires Walls and Viaduct (86876). Ills. 1500 w. Eng News-Rec—June 13, 1918. Details of work in Kansas City.

High-Line Viaduct and Bridge Improve Rail Entrance to Kansas City (84615). F. W. Epps. Map and Ills. 3500 w. Eng

News-Rec—Feb. 28, 1918. Details of structures on new route.

Design and Construction Features of Concrete Viaduct Approach to Central Ave. Bridge, Kansas City, Kan. (87797). Ills. 1200 w. Eng & Con—July 24, 1918. Artistic concrete design.

The Langwies Reinforced Concrete Viaduct (87917). Ills. 500 w. Eng & Con—July 31, 1918. Arch of 96 meters clear span between abutments, in Switzerland. Interesting arch-centering.

Effective Concrete Architecture in New Viaduct (85733). Ills. 2000 w. Eng News-Rec—April 19, 1918. Design and construction methods.

Hinged Polygonal Steel Arch Carries Viaduct Spans (85327). Ills. 1500 w. Eng News-Rec—March 28, 1918. Plate-girder spans supported by novel use of arch trusses over deep gorge near Marquette, Mich.

Renewing the Moorabool Viaduct (88835 N). A. Goudy. Ills. 1000 w. Comwh Engr—Aug., 1918. A great undertaking by the Victorian Rys.

War Construction

French Engineers Span Aisne River Under Shell Fire (82724). Robert A. Drake. Ills. 2000 w. Eng News-Rec—Nov. 29, 1917. Details of construction of bridge to replace one destroyed by Germans.

Wilson Bridge

Le Pont Wilson, A Lyon (88427 B). A. Dumas. 5700 w. Génie Civil—July 13, 1918. New arch bridge over the Rhone, at Lyons, France. See France.

World's Bridges

The Principal Bridges of the World—A Comparison (86833 A). Plate. 4000 w. Engr—May 24, 1918. Serial, 1st part. Sketches made to the same scale of drawing comparing as to size, importance, design, etc.

See also Canals, under Waterways and Harbors.

CONSTRUCTION

Administrative Offices

Three Wooden Buildings to Hold 10,000 Government Employees (84389). Ills. 1200 w. Eng News-Rec—Feb. 21, 1918. Offices under construction in Washington, D. C.

American Construction

Engineers Convert French Beet-Sugar Fields Into Advance Depot (87314). Robert K. Tomlin, Jr. Ills. 3500 w. Eng News-Rec—July 4, 1918. Structures built for American Expeditionary Forces.

Architecture

Architects Must Put Utility Before Aesthetics (87219). 3000 w. Eng News-Rec—June 27, 1918. From article by C. H. Blackall, in Am. Architect. What constitutes an architect? The future outlook and opportunities.

Army Depot

Army Intermediate Depot in France Problem in Getting Labor and Supplies (88778 A). Robert K. Tomlin, Jr. Ills. 2500 w. Eng News-Rec—Sept. 12, 1918.

Beams

Project covers site six miles long. Types of warehouses being built.

Beams

Design of Restrained Beams Carrying Hydrostatic Load (83700). E. H. Darling. Ills. 1000 w. Can Engr—Jan. 17, 1918. Diagrams and explanation.

Building

L'Évolution Scientifique De L'Art De Batir (87117 B). C. Rabut. Ills. 7700 w. Revue Générale des Sciences—Apr. 30, 1918. Development of the art of building exemplified in modern structures.

Building Details

Balcony of Concrete Theater Has Novel Framing (82726). Ills. 1800 w. Eng News-Rec—Nov. 29, 1917. Diagonal beams reduce cantilever moments. Cinder-concrete steps reduce loads.

Steel-Frame Hall Forms Top Story of Concrete Building (82975). Ills. 1000 w. Eng News-Rec—Dec. 13, 1917. Details of structural framing in a reinforced-concrete building in Chicago.

Structural Features of 130 Ft. Tower of New Pennsylvania Freight Station in Chicago (83232). Jos. E. Love. Ills. 900 w. Eng & Con—Dec. 26, 1917. Details of the steel frame, the wind loading and bracing.

One-Hundred-Foot Concrete Arch Carries Theater Balcony (84112). Clarence W. Driver. Ills. 1000 w. Eng News-Rec—Feb. 7, 1918. Details of work in Edison building in Los Angeles.

Building Industries

The National Position of the Construction Industry (85182). 2200 w. Eng & Con—March 20, 1918. From address by A. P. Greensfelder, before the Natl. Con. of Builders' Exchanges, Pittsburgh, Pa.

Building Laws

Puzzling Variations in Important Building-Law Clauses (89130 A). R. Fleming. 3000 w. Eng News-Rec—Sept. 26, 1918. Requirements as to stresses; wind bracing neglected, etc.

Building Materials

Building Materials (85201). 2000 w. Times Engng Supp—Feb. 22, 1918. Formation of a Research Committee of British Dept. of Scientific and Industrial Research for investigation of building materials.

Buildings

The Army Libraries and Liberty Theatres (87997 B). Alfred Morton Githens. Ills. 1700 w. Arch For—July, 1918. Description of buildings, cost, requirements, etc.

CONSTRUCTION**Cantonments**

Army Supply Depot at Chicago Is Large Concrete Warehouse (88085 A). A. Epstein. Ills. 1500 w. Eng News-Rec—Aug. 8, 1918. One of the largest reinforced-concrete buildings in the world nearing completion, to be used as a storage warehouse for the army.

The New Buildings of Massachusetts Institute of Technology (83267 B). George Elling. Also Student Housing, by H. E. Kebbon. Ills. & 9 plates. 2000 w. Arch For—Dec., 1917. An appreciation of the architecture.

What Is Mill Building Construction? (83203). F. W. Dean. Ills. 4500 w. Eng News-Rec—Dec. 27, 1917. Essentials governing this type of fire-resisting building.

Report of Committee VI—On Buildings (84479 N). 28 pp. A R E A, Bul—Dec., 1917.

Caissons

Concrete Caisson of New Type Used in Breakwater (88081 A). Ills. 1200 w. Eng News-Rec—Aug. 8, 1918. Trapezoidal shape adopted for economy.

Land Big Drop Shaft on Seal and Curb Wall (83674). Ills. 1200 w. Eng News-Rec—Jan. 17, 1918. Fifteen-pocket concrete caisson sunk 100 feet.

Canteen Construction and Equipment (88178 B). Ills. 14 pp. Cas Eng Mthly—July, 1918. Serial, 1st part. Principles of canteen construction and the most beneficial equipment.

Cantonments

Recreation Buildings for Officers and Men at the National Army Cantonments (88541 B). Ills. 2200 w. Arch For—Aug., 1918. Detailed descriptions.

Engineering and Construction Features of Cantonments (82955 A). Richard C. Marshall, Jr. Ills. 2000 w. E Cb Phila, JI—Dec., 1917. Problems met.

Army Cantonment Construction at Camp Meade, Maryland (85065 B). N. B. Garver. Ills. 15 pp. West Soc Engrs, JI—Dec., 1917. The general organization, the handling of materials and building erection.

Construction of Cantonment at Camp Grant (85064 B). Charles B. Burdick. Ills. 15 pp. West Soc Engrs, JI—Dec., 1917. Plan of procedure to make speed possible.

Heating, Cooking and Laundry Equipment of the National Army Cantonments (85066 B). A. C. Willard. Ills. 22 pp. West Soc Engrs, JI—Dec., 1917. Discussion applying to 16 cantonments.

CONSTRUCTION

Concrete

Cantonments

The Solution of the Cantonment Construction Problem (83333 A). Leonard Metcalf. 4000 w. A S M E, JI—Jan., 1918. Details of the work of the Cantonment Construction Division.

Cantonment Construction (86838 B). Morris Knowles. Plans & Ills. 35 pp. Engrs Soc W Penn—March, 1918. Problems connected with the housing and living conditions of soldiers during their early training.

Cash Register Building

58000 Square Feet of Floor Space in 30 Days (87777 A). Ills. 500 w. Ind Man—Aug., 1918. Features of construction of a new building in Dayton, Ohio, for Nat'l Cash Register Co.

Cement Gun

Cement-Gun Construction Methods (88065). Bryan Cheves Collier. Ills. 2000 w. Can Engr—July 12, 1918. Reviews application of gunite to wall construction and similar work.

Facilitating the Construction of Water and Sewerage Works by Means of the Cement-Gun (86677 A). Ills. 1500 w. Mun Eng—June, 1918. Examples of successful application of the cement-gun process.

Chimneys

Graphic Method of Chimney Design (88586). H. M. Brayton. Ills. 1000 w. Power—Sept. 3, 1918. Method of designing without calculations by combining long and complicated formulæ.

Tall Chimneys in Metallurgical Plants (87863 A). Ills. 2000 w. Eng & Min JI—July 27, 1918. Some of the notable chimneys in use at metallurgical plants in the United States and Japan.

Brick Chimney of Record Height Built to Carry Off Smelter Gases (85464). Charles Evan Fowler. Ills. 1200 w. Eng News-Rec—April 4, 1918. Proportioned to resist wind pressure of 78 lb. per sq. ft. Foundations carried down to hard clay.

Practical Notes on Chimneys and Draft (82114). W. A. Pittsford. Ills. 1200 w. Ht & Vt Mag—Oct., 1917. Data on chimney construction and draft troubles.

Coal Waste

Suggestions for Saving Coal in Construction Operations (86282). George E. Ladd. Notes from *Public Roads*. 3000 w. Eng & Con—May 15, 1918.

Cofferdams

Methods and Cost of Cofferdam Construction at Oregon City Locks, Willamette River, Oregon (85069 B). E. Burlem Thomson. Ills. 20 pp. Prof-

Mem—March-April, 1918. Particularly, methods used in the construction of the concrete division wall.

Columns

Discussion on Final Report of the Special Committee on Steel Columns and Struts (88739 D). 20 pp. A S C E, Pro—Aug., 1918. Continued from April issue.

Concrete

Concrete Foundations, Drift Linings and Reservoirs (87949). J. F. Springer. Ills. 4800 w. Cl Age—Aug. 1, 1918. Directions for the use of concrete in work named.

City Designs Forms for Portland Grade Separation (86875). Ills. 1200 w. Eng News-Rec—June 13, 1918. Methods of handling concrete for abutments and retaining walls.

Designing Wall Beams in Concrete Flat-Slab Buildings (86873). Albert M. Wolf. Ills. 2500 w. Eng News-Rec—June 13, 1918. Reinforcement details governed by construction.

Discussion of Economy in the Design of Concrete Buildings (87578 B). 15 pp. Bos Soc C E, JI—June, 1918. Discussion of Mr. Mayer's paper.

Recommended Practice for Concrete-Bridge Construction (87534). 4000 w. West Eng—July, 1918. General specifications prepared by engineers of the Portland Cement Assn.

Recommended Practice for Concrete Bridge Construction (87689). 4500 w. Can Engr—July 18, 1918. General specifications prepared by engineers of the Portland Cement Assn.

Economy in the Design of Concrete Buildings (84376 B). Clayton W. Mayers. Ills. 26 pp. Bos Soc C E, JI—Feb., 1918. Effects of design on cost; comparative estimates, etc.

Traveling Towers Place 92,000 Yards of Concrete (83532). Ills. 1000 w. Eng News-Rec—Jan. 10, 1918. Stationary measuring plants on large steel mill work cut labor costs.

Two New Designs of Houses of Concrete Throughout (86291). Ills. 900 w. Eng News-Rec—May 16, 1918. One has units poured in wire cloth forms with air space in walls, other uses cement-gun and pre-cast beams.

Unit-Built Concrete Dwellings at Youngstown, Ohio (86226). Harvey Whipple. Ills. 1800 w. Cl Age—May 11, 1918. Details of fireproof dwellings for Youngstown Sheet and Tube Co.

Concrete Building Has Long-Span Girders and Floor (82730). Ills. 1000 w. Eng News-Rec—Nov. 29, 1917. Building details at Emory University.

Concrete

CONSTRUCTION

Construction Plant

Large Cold-Storage Building Introduces New Problems in Concrete Design (82425). Ills. 2500 w. Eng News-Rec—Nov. 15, 1917. Complications from division of building into five parts by insulation, which required split columns and intermediate walls.

Concrete Arches

How to Proportion Unsymmetrical Concrete Arches (84617). Joseph P. Schwada. Ills. 1000 w. Eng News-Rec—Feb. 28, 1918. Develops formula for dimensions of ring.

Concrete Beams

Long-Span Concrete Beams Should Have Fixed Ends (88319 A). W. S. Tait. Ills. 1000 w. Eng News-Rec—Aug. 22, 1918. Method by which computation of rigid frame design may be readily made.

Placing 52-Ton Pre-Cast Beams on North Toronto Bridges of C. P. Ry. (87800). Ills. 1000 w. Eng & Con—July 24, 1918. Describes work at North Toronto, where two single-track steel bridges were replaced by reinforced concrete structures.

Contract Forms

"Cost Plus" Contract Forms of Fred T. Ley & Co., Inc., Hurley-Mason Co. and Ferro Concrete Construction Co. (83233). 4000 w. Eng & Con—Dec. 26, 1917. Main features of contract forms of these companies.

"Cost Plus" Contract Forms of Stone & Webster (82722). 1500 w. Eng & Con—Nov. 28, 1917. Gives forms used by this concern.

The "Cost Plus" Form of Contract Used on Cantonment work, Including a Schedule of Equipment Rental Rates (82723). 5000 w. Eng & Con—Nov. 28, 1917. Form of government contract.

Concrete Houses

Precast and Field Cast Concrete Houses (84058). J. B. Warriner. Ills. 1000 w. Cl Age—Feb. 2, 1918. Construction of dwellings built of a combination of pre-cast and field cast concrete.

Concrete Piles

Betonpalen (83316 B). V. Disselkoen. Ills. 2600 w. Ingenieur—Nov. 24, 1917. Design and application of concrete piling developed by Dutch engineers.

Les Pieux En Béton Armé (88425 B). A. Bijls. 3400 w. Génie Civil—July 6, 1918. Reports on use of concrete piles in the Low Countries.

Les Fondations En Terrains Compressibles (83908 B). M. Bousquet. Ills. 2300 w. La Nature—Dec. 29,

1917. The Frankignoul system of concrete piling for foundation work in soft ground.

Concrete Pit

Concrete Lined Pit Built Without Shifting Bracing (88783 A). H. D. Loring. Ills. 1200 w. Eng News-Rec—Sept. 12, 1918. Work at Carthage, O. Construction speed increased by sacrificing salvage of sheeting.

Concrete Plant

Concrete Plant on Boston Dry Dock Almost Automatic (84005). Edmund M. Blake. Ills. 2500 w. Eng News-Rec—Jan. 31, 1918. Electrically operated, belt-fed concrete plant of 100 yd. an hour capacity.

Contract Records

Visible Record System for Expediting Construction Contracts (87799). 1000 w. Eng & Con—July 24, 1918. System employed by the Public Works Office of the Philadelphia Navy Yard, as described by DeWitt C. Webb.

Contractors

The Standing and Compensation of the Building Contractor (87201). 2000 w. Eng & Con—June 26, 1918. Suggestions from a paper by W. A. Klingner for improving the status, increasing the compensation and improving the business ability of contractors.

Contracts

Cost-Plus Contracts (88505). P. B. Glasco. 1200 w. Eng & Con—Aug. 28, 1918. The advantages of the system.

New Contract System Which Stimulates Efficiency Gaining Favor (87625). Henry D. Hammond. 3000 w. Eng News-Rec—July 18, 1918. The superiority claimed for the method.

Cost-Plus-Profit Contract Is Commended (85063 A). 1800 w. Iron Age—March 21, 1918. Council of National Defense proposes it with safeguards for large amount of construction work.

A Fair Royalty Contract (85160). Robert G. Pilkington. 1800 w. Am Mach—Feb. 28, 1918. Discussion of royalty contract between employer and employee.

Construction Camps

The Housing and Feeding of Construction Forces (82576). F. E. Weise. Read before Am. Ry. Bldg. & Bldg. Assn. 2500 w. Eng & Con—Nov. 21, 1917. Suggestions for construction engineers and contractors.

Construction Plant

Arch Bridge Is Concreted from Cars on Elevated Track (85739). Ills. 1000 w. Eng News-Rec—April 18, 1918. Unusual construction plant at Des Moines, Ia.

CONSTRUCTION

Foundations

Coördination

Coördination Saves Six Weeks' Construction Time on Big Building (88243 A). Ills. 2500 w. Eng News-Rec—Aug. 15, 1918. Duplicate equipment eliminates delays; promoting esprit de corps among men is important feature.

Culverts

Forcing Culverts Under Roads With Hydraulic Jacks (87218). Ills. 1200 w. Eng News-Rec—June 27, 1918. Pipes up to 4-foot diameter installed at costs lower than by open-cut method.

Dams

See same heading under Water Supply.

Emergency Construction

Emergency Construction Work Due to War Conditions, with Especial Reference to the Construction Division of the Army (86549 D). George W. Fuller. 70 pp. A S C E, Pro—May, 1918. Deals particularly with the housing of the new U. S. National Army, and lessons from experience with emergency construction work.

Factories

Construction of a "Standard" Factory Building for the New York Air Brake Co., at Watertown, N. Y. (82903). Ills. 1000 w. Ry Rev—Dec. 8, 1917. Detailed description.

Unusual Factory Layout Designed to Simplify Operation (82727). Ills. 1200 w. Eng News-Rec—Nov. 29, 1917. A concrete building in Flushing, L. I.

Factories

How a Chain Factory Was Built and Then Occupied (87006 A). Charles Lundberg. Ills. 2500 w. Iron Age—June 20, 1918. Details of a factory in Indianapolis employing 1,000 employees and between 600 and 700 machines.

New Plant of Diamond Chain Company (87093 A). Ills. 1000 w. Ind Man—July, 1918. Features of buildings and equipment for manufacturing roller chain and sprockets for power transmission.

Standardization in Factory Buildings (84438). Ills. 1500 w. Auto Ind—Feb. 21, 1918. Standardized plans, with a structural steel work fabricated in advance.

Factory Floors

Causes and Prevention of Failure in Creosoted Wood Block Factory Floors (85298). Lambert J. Ericson. Abstract of paper before Am. Wood Preservers' Assn. 2500 w. Eng & Con—March 27, 1918. Conclusions based on service records and personal observations.

Fireproof

Modern Fire Proof Buildings (88162 N). Charles H. Nichols. Ills. 16 pp. Vt Soc Engrs, Pro—March 13, 1918. Reviews development and construction.

Fireproofing

Fire Proof Building Construction by Cement Gun Process (83235). Ills. 700 w. Eng & Con—Dec. 26, 1917. Work of the Cement Gun Construction Co. of Chicago.

Flat Slab

Some Notes on Flat Slab Design: Thickness of Slab, Column Heads and Bending in Columns (84545). Albert M. Wolf. Ills. 3500 w. Eng & Con—Feb. 27, 1918. Considers points of importance to designers.

Floor Loads

Suggested Reforms in Floor-Load Requirements of City Building Laws (87215). R. Fleming. 3500 w. Eng News-Rec—June 27, 1918. Comments on the excessive live loads specified in many codes, with suggestions tending toward uniformity.

Floors

Core Construction (87373). A. H. Bromley, Jr. Ills. 2500 w. Can Engr—July 4, 1918. Read before Am. Concrete Inst. Details of design and construction.

Chicago Reinforced-Concrete Flat-Slab Ruling Amended (83095). 4000 w. Eng News-Rec—Dec. 20, 1917. New ordinance changes certain features. Also "Why the Chicago Flat-Slab Ruling Was Revised. John Krippner. Ills. Comments.

The Flat-Slab System—A Topical Discussion (86409 B). Ills. 37 pp. Engrs' Soc W Penn, Pro—Feb., 1918.

What Is a Good Concrete Floor? (86565 A). Leonard C. Wason. 2200 w. Ind Man—June, 1918. Methods of preparing and laying such floors; treatment of the material after it is placed, etc.

Fortifications

The Influence of the European War Upon the Art of Field Fortifications. (88368 B). F. B. Wilby. Ills. 65 pp. Prof Mem—July-Aug., 1917. Lessons from experience in the European war.

Foundations

Sinking Six Cylinder Foundations a Day on Boston Army Supply Base (89-132 A). Ills. 2500 w. Eng News-Rec—Sept. 26, 1918. Concrete open wells of 6-ft. outside diameter, and from 33 to 55 feet deep. Careful planning and use of handling machinery gives results.

Foundations

Boiler House as Stack Foundation (87865). L. C. Huff. Ills. 1500 w. Power—July 30, 1918. Four-story steel and concrete building used as foundation for large steel stack.

Repair Work to Heavy Foundations (87414 A). Sidney Gill, with discussion. Ills. 3500 w. Ir & Cl Trds Rev—June 14, 1918. Difficulties experienced and methods adopted to overcome them. Read before Natl. Assn. of Colly. Mgrs.

Foundations of the New Buildings of the Massachusetts Institute of Technology, Cambridge, Mass. (83898 B). Charles T. Main and H. E. Sawtell. Ills. 37 pp. Bos Soc C E, JI—Jan., 1918. Describes geological conditions, foundations and reasons governing types used, tests, etc.

Een an Ander Omtrent den Druk van het Grondwater onder Bouwwerken (84595 B). R. Soman. 6500 w. De Ingenieur—Dec. 29, 1917. Methods of resisting pressure of ground water in deep foundation work.

Framing

Composite Steel and Concrete and Steel Framing Construction (84133 N). 1500 w. Comwh Engr—Jan., 1918. New regulations for Sydney, Australia.

Framing Plan

Framing Plans Simplify Fieldwork on Cincinnati High School (88318 A). John T. Sullivan. Ills. 1800 w. Eng News-Rec—Aug. 22, 1918. Single-sheet framing plan gives all data required by form builders and steelworkers.

Garage

Main Beams in Concrete Garage Are Forty-nine Feet Long (86623). Ills. 1200 w. Eng News-Rec—May 30, 1918. Garage recently erected in Pittsburgh, Pa.

Girders

Circular-Arc Bow-Girder (84142 A). William Knight. Diagrams. 1500 w. Engng—Jan. 18, 1918. Formulæ, published by A. H. Gibson and E. G. Ritchie of interest to the designer.

Grain Elevators

Corn Production Stimulated in South by Construction of Small-Capacity Elevators (84777). Chauncey Smith. Ills. 1600 w. Mfrs' Rec—March 7, 1918.

Granary

A Modern Granary (84135 A). G. E. Baxter. Details from a paper read before the Instn. of Engrs. & Shipbldrs. in Scotland. Ills. 1800 w. Elec'n—Jan. 18,

CONSTRUCTION**Housing**

1918. Serial, 1st part. Equipment of Meadowside granary, which has a capacity of 31,000 tons of wheat.

Halifax

Reconstruction of Devastated Halifax (87058). Ills. 6000 w. Can Engr—June 20, 1918. Describes relief organization and methods and the rapid recovery of this maritime port.

Housing

Construction Camps Model Towns on Miami Flood Works (89129 A). Ills. 2500 w. Eng News-Rec—Sept. 26, 1918. Villages of homes with all modern conveniences house workmen at the five large dams being built.

Housing at Tyrone, New Mexico (89559 A). Charles F. Willis. Ills. 1500 w. Chem & Met Eng—Oct. 15, 1918. Account of the efforts of the Phelps Dodge Corporation to provide wholesome living conditions for its employees.

Housing Development for the Air Nitrate Corporation, Sheffield, Alabama (89280 B). Charles C. May. Ills. 2000 w. Arch For—Sept., 1918. Details of town development.

Housing of Labor and Sanitation at Mines in India (89591 N). J. H. Evans, with discussion. 8 plates. 3000 w. Min & Geol Inst of India, Trans—April, 1918. Types designed to suit conditions in India.

Industrial Housing (89597 A). Benjamin Wilk. Ills. 11 pp. Af Eng Soc's of Minn, Bul—Oct., 1918. Discusses housing and social problems of working men.

Recent Dwelling Construction in Pennsylvania (85750). Dever C. Ashmead. Ills. 1500 w. Cl Age—April 20, 1918. Miners' houses, with bill of materials.

Unit-Built Concrete Cottages to House Foreign Labor (85558). Ills. 1500 w. Eng News-Rec—April 11, 1918. Dwellings in Youngstown Sheet & Tube Co.'s village.

Engineering Possibilities of Circular Housing Plan (88524). G. J. Lamb. Ills. 1200 w. Can Engr—Aug. 29, 1918. Advantages include economy of fuel, more sunlight, better surroundings, etc.

Engineering Data Required for a Housing Project (86877). 2500 w. Eng News-Rec—June 13, 1918. Federal Bureau of Housing of Department of Labor issues instructions to be followed by preliminary investigators.

How Erie Is Solving the Housing Problem (86594 A). Ills. 2500 w. Iron Age—May 30, 1918. Details of house-building work.

Housing

CONSTRUCTION

Housing

The Workman's Home: Its Influence Upon Production in the Factory and Labor Turnover (86685 A). Leslie H. Allen. 7000 w. A S M E, JI—June, 1918. Housing of the working classes in America.

Community Courts for Factory Workers (84328 A). Charles Alma Byers. Ills. 1600 w. Arch Rec—Feb., 1918. Shows this idea as developed in California.

Regular Towns Must Be Built to Adequately House Industrial Armies (84436). Samuel G. Willmer. Ills. 3000 w. Mfrs Rec—Feb. 21, 1918. Outline of what is planned and what is being done.

Some Aspects of Industrial Housing (84082 B). Charles C. May. Ills. 4000 w. Arch For—Jan., 1918. Serial, 1st part. Introductory and examples of industrial town planning from the work of John Nolen.

The Need for Industrial Housing (84-083 B). 2500 w. Arch For—Jan., 1918. The great problem now before the U. S. Government.

Industrial Housing (83603 A). H. W. Forster. 3500 w. E Cb Phila, JI—Jan., 1918. Type of housing needed, and facts relating to the situation.

How Shipyard Housing Work Is Organized and Operated (87626). 2000 w. Eng News-Rec—July 18, 1918. Organization developed by division of fleet corporation.

Housing the Low Paid Workman (86162 D). William Roger Greeley. Ills. 1500 w. Arch For—April, 1918. Experiment in government aid under direction of the Massachusetts Homes Commission.

Housing Our Shipyard Workers (86105 A). Waldon Fawcett. 2500 w. Int Mar Eng—May, 1918. Delayed by lack of housing facilities.

Housing the Single Worker (86164 D). Walter H. Kilham. Ills. 3500 w. Arch For—April, 1918. The designing of boarding houses.

Housing Types for Workmen in America (86156 D). Charles C. May. Ills. 3500 w. Arch For—April, 1918. Survey of various types used and their prime essentials discussed.

Jefferson Rouge, the Development of Solvay Process Company, Detroit, Mich. (86157 D). Ills. 500 w. Arch For—April, 1918. Plans carried out by Mann & MacNeille, architects and town planners.

The Multifamily House for Industrial Housing (86573 A). Henry Atterbury Smith. Ills. 700 w. Ind Man—June, 1918. Method of development to secure housing efficiency and economy.

Living Close to the Melting Pot (86163

D). Marguerite Walker Jordan. Ills. 3000 w. Arch For—April, 1918. Suggestions for meeting conditions of housing imposed by foreign-born laborers.

Methods of Economy in Housing Construction (86158 D). Charles A. Whittemore. 3502 w. Arch For—April, 1918. Suggestions that make for economy and phases of the problem.

The Architect's Relationship to an Industrial Housing Development (86154 D). Perry R. MacNeille. 2500 w. Arch For—April, 1918. Outlines the general organization and methods for handling.

The Essential Principles of Industrial Village Development (86152 D). John Nolen. Ills. 4000 w. Arch For—April, 1918. Problems in industrial community development are discussed in detail.

The Financial Aspect of Industrial Housing (86160 D). C. Stanley Taylor. 4500 w. Arch For—April, 1918. Study of projects for financing plans for better housing of workers.

War-Time Housing—A Supreme Opportunity (86151 D). Andrew Wright-Crawford. Ills. 2500 w. Arch For—April, 1918. The effect of poor housing; the standards in England and Scotland; and the needs of America.

Industrial Housing (84989 B). H. Walter Forster, with discussion. 33 pp. Engrs' Soc W Penn, Pro—Dec., 1917. Present shortage in housing, type needed, cost, etc.

Industrial Housing Developments in America (84871 A). Lawrence Veiller. Ills. 3000 w. Arch Rec—March, 1918. Serial, 1st part. Present article deals with "Eclipse Park," Beloit, Wis.

The Housing Problem (85061 A). W. E. Freeland. Ills. 4000 w. Iron Age—March 21, 1918. Accomplishments of the Bridgeport Housing Co., showing what the owner of a city factory can do.

Building Frame Houses for Miners As a Contract Job (83205). C. S. Rindfoos. Ills. 1800 w. Eng News-Rec—Dec. 27, 1917. Methods used in building several hundred for West Virginia Company.

Construction of Industrial Villages for Workmen (82719). Ills. 2000 w. Eng & Con—Nov. 28, 1917. Details of propositions completed and in progress.

Housing and Town Planning Problems After the War (83201 A). 4500 w. Surv'r—Nov. 23, 1917. Interim report of Technical Conference of National Council.

Housing Developments at Lee Park, and Wanamie (82908). E. H. Poggi,

Housing

Ills. 1800 w. *Cl Age*—Dec. 8, 1917. Conveniences provided in modern mine houses.

Housing Problems After the War (83058 A). S. D. Adshead. 2000 w. *Surv'r*—Nov. 30, 1917. Serial, 1st part. First of a course of six lectures being delivered in London.

Industrial Housing Problems (83212 A). Leslie H. Allen. Ills. 3500 w. *Iron Age*—Dec. 27, 1917. Essentials of dwellings for skilled and unskilled workers. From paper before Natl. Housing Assn., Chicago.

Industrial Housing (82618 B). Charles C. May. Ills. 3500 w. *Arch't Forum*—Nov., 1917. Notes on the sixth conference of the National Housing Assn.

Scottish Housing (82133 A). 3500 w. *Surv'r*—Oct. 12, 1917. Royal Commission's report: Drastic recommendations.

The Problem of Industrial Housing (82641 A). Leslie H. Allen. Ills. 3800 w. *Ind Man*—Dec., 1917. Reviews difficulties and possibilities.

Industrial Buildings

Getting the Greatest Return from Plant Investment (83295 A). Hugh M. Wharton. 1000 w. *Ind Man*—Jan., 1918. Design of industrial buildings for their effect on quantity, speed and cost of production.

Industrial Towns

Broader Economy in the Maintenance of an Industrial Village (86161 D). Horace B. Mann. 2500 w. *Arch For*—April, 1918. Analysis of economical maintenance and management.

Elmwood Park, Bethlehem, Pa. (86155 D). George S. Welsh. Ills. 700 w. *Arch For*—April, 1918. Development for housing workmen of the Bethlehem Steel Co.

The Development of the Midvale Steel Company, Coatesville, Pa. (86113 D). W. Leslie Walker. Ills. 1100 w. *Arch For*—April, 1918. Describes town planned with a view to health and happiness.

Tyrone, New Mexico, the Development of Phelps-Dodge Corporation (86159 D). Ills. 1000 w. *Arch For*—April, 1918. Work of Bertram Grosvenor Goodhue. Details of houses.

Italy

La Diga Di Combamala Dell 'Impiant Del III Salto Della Maira (85868 B). Ills. 1000 w. *L'Industria*—Feb. 15, 1918. Large reinforced concrete dam 124 ft. high.

Lighthouses

Caissons and Cribbs for Lighthouse Foundations (83535). Ills. 2000 w. *Eng News-Rec*—Jan. 10, 1918. Lights in Detroit River have concrete piers

CONSTRUCTION**Ore Dock**

built in timber cribs or formed by concrete caissons sunk in place.

Methods

How Construction Was Speeded Up by Doing Three Jobs at One Time (82856). Ills. 1600 w. *Eng News-Rec*—Dec. 6, 1917. Increasing the height of three dams on Huntington Lake, Calif., permitted concentration of labor.

Mill Buildings

Wood in the Construction of Mill Buildings (88067). W. Knoch and R. J. Blair. Ills. 2000 w. *Can Engr*—Aug. 1, 1918. Is it a suitable material?

Mill Design

Machinery and Footing Complications Control Mill Design (82314). W. Stuart Tait. Ills. 1500 w. *Eng News-Rec*—Nov. 8, 1917. Three different kinds of foundations, and other details of interest.

Military Engineering

The German Shelters on the Somme (88366 B). Ills. 8 pp. *Prof Mem*—July-Aug., 1917. Detailed description.

Deep Gallery Shelters (84486 B). A lecture by P. S. Bond and R. D. Leisk. Ills. 10 pp. *Prof-Mem*—Jan.-Feb., 1918. Field works in the present war and their construction.

Use of Corrugated Iron for Construction of Shelters (84487 B). Henry Swift. Ills. 10 pp. *Prof-Mem*—Jan.-Feb., 1918. Uses for which it is adapted.

Mining Operations, Especially for Infantry (84490 B). W. R. Livermore. Ills. 17 pp. *Prof-Mem*—Jan.-Feb., 1918. History of mine warfare is reviewed.

Mining Towns

Fireco—A New Mining Town in West Virginia (88788). Ills. 3800 w. *Cl Age*—Sept. 12, 1918. Town planned for social and physical welfare.

M. I. T. Buildings

Concrete Materials and Design of the New Buildings of the Massachusetts Institute of Technology, Cambridge, Mass. (83899 B). Sanford E. Thompson. Ills. 13 pp. *Bos Soc C E*, *Jl*—Jan., 1918. Engineering studies and investigations that determined the structural features of these concrete buildings.

Ore Dock

Extension to Superior Ore Dock Built of Concrete (87211). Ills. 2000 w. *Eng News-Rec*—June 27, 1918. Details of Northern Pacific structure.

The 600 Ft. Reinforced Concrete Extension of N. P. Ry. Ore Dock at Superior, Wis. (87619). W. D. Engelke. Ills. 1200 w. *Eng & Con*—July 17, 1918. Methods of construction.

PARTITIONS

Scaffolds

Partitions

Practical Points in the Design and Construction of Partitions (88509). H. L. Barraclough. From paper before Concrete Inst., London. 1500 w. Eng & Con—Aug. 28, 1918. Information concerning partition slabs and their erection.

Some Practical Points in the Design and Construction of Partitions (85809). H. L. Barraclough. Read before the Concrete Inst. 2000 w. Can Engr—April 18, 1918. Considers a few classes of fire-resisting partitions most used, their construction and troubles.

Piers

Handling Machinery Feature of Erection of Ocean Pier (85911). 2200 w. Eng News-Rec—April 25, 1918. Details of machinery used for heavy timber work at Vancouver terminal.

Portable Houses

Portable Houses for Overseas Forces Built in Record Time by New Methods (83456). Ills. 2000 w. Eng News-Rec—Jan. 3, 1918. Good management giving unusual results. See also under Housing.

Quebec

See same heading under Waterways and Harbors.

Rapid Building

Concrete Army Warehouses Built in Record Time (84245). Edgar H. Mosher. Ills. 1500 w. Eng News-Rec—Feb. 14, 1918. Low structures of large area expedited by careful arrangement of building processes.

Reinforced Concrete

Results of Test on Robert Simpson Building (85363). W. W. Pearce and Peter Gillespie. Ills. 2300 w. Can Engr—March 28, 1918. Test of Toronto building constructed on the four-way reinforced concrete system.

Brooklyn Naval Storehouse Finished Ahead of Schedule (82586). Ills. 1500 w. Eng News-Rec—Nov. 22, 1917. Eleven-story concrete building frame completed with roof in fourteen weeks.

Revised Code of Bureau of Yards and Docks for Design of Reinforced Concrete Structures (86437). 2500 w. Eng & Con—May 22, 1918. Main features of the revised code.

Reinforced Concrete Constructions; Marriott System (83757 A). Ills. 1200 w. Engng—Dec. 28, 1917. Uses to which this system has been applied, particularly in railway structures.

Reinforced Concrete Slab Floors

The New Chicago Rules for Design of Reinforced Concrete Slab Floors (83846). 3000 w. Eng & Con—Jan. 23, 1918. New ruling that went into effect Jan. 1, 1918. See also page 56.

Repairing

Methods of Maintaining and Repairing Old Highway Bridges (84546). G. F. Burch. Ills. 2000 w. Eng & Con—Feb. 27, 1918. Details of methods employed in Illinois.

Retaining Walls

Novel Type of Retaining Wall and Calculations for Its Design (86611). From Ann. des Ponts et Chaussées. 1500 w. Eng & Con—May 29, 1918. Features of a reinforced concrete retaining wall and service results.

Notes on Earth Pressures and Retaining Walls (83160 A). Milo S. Ketchum. Ills. 2500 w. Univ Col J1 Eng—Oct., 1917. Supplementary to the writer's The Design of Walls, Bins, and Grain Elevators.

Roofs

Brick Arch Roofs (87516 N). Edward W. Stoney, with remarks. Ills. 22 pp. Instn C E Ireland, Trans—Vol. XLIII, 1918. Describes examples of arched roofs which have proved economical and successful.

Light and Ventilation Insured in Factory by Unique Roof (85469). Nelson J. Bell. Ills. 1000 w. Eng News-Rec—April 4, 1918. Special form of concrete sawtooth.

Timber-Arch Truss Roof with Steel Gasket-Plates (85325). H. W. Sheley. Ills. 1800 w. Eng News-Rec—March 28, 1918. Details of three-hinged arch garage roof in Salt Lake City.

Cast-in-Place Reinforced-Gypsum Roof Slabs on Paper-Mill Buildings (82203). Ills. 900 w. Eng News-Rec—Nov. 1, 1917. New methods developed.

Safety

The Opportunities for Safety Engineering in Construction Work (88316). David Van Schaack. Abstract of paper before the Conn. Soc. of C. E. 2000 w. Eng & Con—Aug. 21, 1918. Features of accident prevention are considered.

Scaffolds

Safe Construction of Scaffolds and Falsework (88934). T. F. Foltz. Abstract of paper before the Nat. Safety Council. 3500 w. Eng & Con—Sept. 18, 1918. Directions for various types of scaffolds and the general requirements.

CONSTRUCTION

Workmen's City

Shafts

Drop Shafts Sunk Through Buried Tree Trunks by Dredging (88779 A). Ills. 1600 w. Eng News-Rec—Sept. 12, 1918. Unusual work in connection with foundations for power station in Kansas City.

Sicily

La Ricostruzione Di Messina (87702 B). Ills. 1800 w. Monitore Tecnico—Apr. 10, 1918. Serial, 1st part. Reconstruction and rearrangement of important buildings damaged by earthquake.

Simplon

Der Förderbetrieb beim Ausban des II. Simplontunnels (85862 B). F. Rothpletz and C. Andreae. Ills. 2800 w. Schweiz. Bau-Zeitung—March 2, 1918. Serial, 1st part. Construction of second Simplon tunnel. General features of the work.

Steel Arch

Steel Roof Trusses Are Designed as Elastic Arches (85736). W. Stuart Tait. Ills. 1800 w. Eng News-Rec—April 8, 1918. A steel arch of unusual design for the roof of a natatorium in Moline, Ill.

Swimming Pool

Large Outdoor Swimming Pool Built in Circular Form (86441). C. E. Bliss. Ills. 1200 w. Eng News-Rec—May 23, 1918. Bottom increasing in depth toward center is paved with reinforced concrete.

Tunnel Lining

Pneumatic Mixer Tram on Mount Royal Tunnel (83773). F. C. K. Stuart. Ills. 3500 w. Eng News-Rec—Jan. 24, 1918. Keeping machines close to forms found to give best results.

Tunnels

Connecting Subway Tunnel Tubes in Quicksand (88849 A). Ills. From N. Y. Contracting. 1500 w. Engng—Aug. 16, 1918. Details of interesting work in Brooklyn in Section 3, route 48, of the N. Y. subway system.

The Use of the Air Hammer Drill in Tunneling Practice (88142 N). Bland Owen. Ills. 4000 w. Comwh Engr—July, 1918. Relative merits of various types of drill bits.

Cross Channel Tunnel (87524). Arthur Fell. Read before the London Soc. 1500 w. Naut Gaz—July 13, 1918. Brief details of tunnels agreed upon by English and French engineers.

The 7000-Foot Tunnel at Lahaina, Hawaii (87532). Fr. Koelling. Ills. 1500 w. West Eng—July, 1918. It has a 6 by 6 ft. horseshoe shaped section and is lined with concrete. Carries water for irrigation of plantations.

Repairing Tunnel Linings with Gunite (87024). 1200 w. Com Air—June, 1918. Tunnels on the Northern Pacific. Work described.

Multiple-Air-Chamber Shield for Large Tunnels (85096). John F. O'Rourke. Ills. 2500 w. Eng News-Rec—March 21, 1918. Face divided into tiers of pockets to carry different air pressures.

Methods Employed in the Construction of a Siphon Tunnel Under the Milwaukee River (82881 A). A. L. Golin. Ills. 2200 w. Mun Eng—Dec., 1917. Details of one of three large, concrete, double-deck siphons included in the new intercepting sewer system.

Geologische und Hydrologische Beobachtungen über den Mont d'Or Tunnel und dessen Anschliessende Gebiete (84582 B). H. Schardt. Ills. 2400 w. Schweizerische Bauzeitung—Dec. 8, 1917. Serial, 1st part. Geology and hydrology of the mountain region of the Mont d'Or tunnel near Vallorbe, Switzerland.

Underpinning

Altering Old Office Building Requires Heavy Underpinning (89247 A). Ills. 1600 w. Eng News-Rec—Oct. 3, 1918. Brick arch floor 60x100 ft. in area raised 3 ft. in two sections. Thick bearing wall replaced by steel framing.

Some Examples of Modern Underpinning (82536 B). Abstracts from paper by Lazarus White and Edmund Astley Prentis, Jr. Ills. 1000 w. Mun Engrs J1—Oct., 1917. Work under the Bank of America, and the National City Bank, in New York City.

Warehouses

Small Army Warehouses Built with Speed and Economy (86621). Ills. 1200 w. Eng News-Rec—May 30, 1918.

Warfare

Conditions and Requirements of Warfare (87310 A). James E. Cassidy. 3000 w. A S ME, J1—June, 1918. The war of material; engineers' part; can-tonments, etc.

War Hospitals

Our War Hospitals in France (84872 A). Edward F. Stevens. Ills. and Plans. 1800 w. Arch Rec—March, 1918. Brief description of plans.

Wharves

See same heading under *Waterways and Harbors*.

Workmen's City

Building a Town to House Three Thousand Shipbuilders (84009). Ills. 2500 w.

Wrecking

Eng News-Rec—Jan. 31, 1918. Details of work at Bristol, Pa., to house workmen and families.

Wrecking

Fire Aids a Heavy Iron Ball in

IRRIGATION AND RECLAMATION**Flume**

Wrecking a Modern Reinforced Concrete Building (82720). Jos. E. Love. Ills. 1000 w. Eng & Con—Nov. 28, 1917. Wrecking methods effecting a saving of time and labor.

IRRIGATION AND RECLAMATION**Agriculture**

Determination of the Duty of Water by Analytical Experiment (84943 D). W. C. Hammatt. Ills. 50 pp. A S C E, Pro—Feb., 1918. Methods used in determining the quantity of water required for the growth of certain crops.

Australia

Irrigation Scheme on the River Murray, South Australia (83766 A). Ills. 500 w. Engr—Jan. 4, 1918. Details of recently completed installation at Berri.

California

Irrigation Project Is Based on Economic Use of Water (83778). 2000 w. Eng News-Rec—Jan. 24, 1918. Limited supply necessitates high duty.

Canal Over Divide Raises Storage Service Factor (87017). Ills. 2000 w. Eng News-Rec—June 20, 1918. Concrete lining reduces seepage; rip rap checks erosion.

\$1,500,000 California Irrigation Project Has Well Supply and 98 Miles of Steel Pipe Line (87479). 2500 w. Eng & Con—July 10, 1918. Features of project in Central Tulare County.

The West Side Irrigation District (84857). Ills. 3300 w. West Eng—March, 1918. A district comprising about 11500 acres near Tracy, Calif.

Terra Bella Irrigation Project Obtains Supply from Wells and Delivers Water Under Pressure Through Steel Pipe Lines (85554). 3000 w. Eng & Con—April 10, 1918. Account of a \$1,000,000 irrigation development depending entirely on underground water.

Dams

The 236-ft. Dam of Murrumbidgee Irrigation Project (87919). Ills. 900 w. Eng & Con—July 31, 1918. Details of work in New South Wales.

Design

Calculations for Design of Irrigation Structures (82515). Charles W. Helmick. Extracts from *Transit*. 800 w. Can Engr—Nov. 15, 1917. Headworks.

Drainage

Keeping Land Drainage Channels Clear of Growth and Debris in the South (88083 A). Albert S. Fry. 4000

w. Eng News-Rec—Aug. 8, 1918. Experiences in removing willow and other sprouts and maintaining cross sections in two drainage districts.

Main Drainage Channels for Reclaimed Areas of Southern Louisiana (88195 A). Charles W. Okey. Map. 1500 w. La Eng Soc, Pro—Aug., 1918. States conditions and discusses the problem.

The Drainage of Bombay (83153 A). C. Carkeet James. 2500 w. Surv'r—Dec. 7, 1917. Historical review.

Proposta Di Bonifica Dello Stagno Di Cagliari (89715 B). L. C. Vecchi. Ills. 5200 w. L'Industria—Aug. 15, 1918. Plan for draining the Cagliari marshes on the island of Sardinia.

Drainage in the Red River Valley in Manitoba (82323). G. B. McColl. Abstract of paper before Can. Soc. of Civ. Engrs. Ills. 2000 w. Can Engr—Nov. 8, 1917. General principles of drainage and their application to special conditions and difficulties.

The Outlook for Land Drainage for the Year 1918 (86122 A). A. H. Beitman. 1200 w. Mun Eng—May, 1918. Importance of reclamation of waste lands.

Durability of Cement Drain Tile and Concrete in Alkali Soils (83656 A). R. J. Wig, G. M. Williams, and A. N. Finn. Ills. 90 pp. U S Bur Stds, No. 95—Nov. 15, 1917. Investigations, tests.

Run-Off from the Drained Prairie Lands of Southern Louisiana (83653 N). Charles W. Okey. 32 pp. U S Gov Print Office—Nov. 5, 1917. Investigations to establish the relation between the rainfall and amount of water necessary to pump.

Economy

Factors Affecting Economical Use of Water in Irrigation (82972). W. L. Powers, in Bul. of Ore. Experiment Station. 1200 w. Eng & Con—Dec. 12, 1917. Results of experimental studies.

Flumes

Reinforced-Concrete Flumes Poured in 100-Foot Lengths (85097). Ills. 600 w. Eng News-Rec—March 21, 1918. Hub and spigot expansion joints in six

Grading

irrigation conduits have been in service two years.

Grading

Grading Land for Furrow Irrigation (83658 A). G. E. P. Smith. 2000 w. West Eng—Jan., 1918. Study of the relations between soil, slope, length of run, and unit head of water should be made.

Hydraulic Filling

Five Million Yards Moved to Dam Three Rivers (83207). Ills. 2000 w. Eng News-Rec—Dec. 27, 1917. Account of work at Bridgewater (N. C.). Flow of two watersheds diverted on third.

Land Improvement

Engineering Work and Food Supply (84929). F. H. Newell. From address before Am Soc of Ag. Engrs. 1800 w. Eng & Con—March 13, 1918. Great possibilities of irrigation and drainage.

Leakage

Why Some Irrigation Canals and Reservoirs Leak (85468). A. P. Davis. Ills. 2500 w. Eng News-Rec—April 4, 1918. Subterranean cavities cause settlements when water is turned in.

Los Angeles

Using Los Angeles Aqueduct Water for Irrigation Purposes (87272 A). C. W. Geiger. Ills. 1200 w. Mun Eng—July, 1918. Arrangements to furnish adequate water to irrigate the beet fields.

Mesopotamia

Irrigation in Mesopotamia (87153). 1000 w. Times Engng Supp—May, 1918. Recent developments, canal system, the Willcocks scheme, etc.

De herbevoëing van Mesopotamie (87108 B). R. G. Hoeffelman. Ills. 10400 w. Ingenieur—Mar. 23, 1918. Characteristics of the delta of the Euphrates and Tigris rivers. Canals, irrigation, climate, floods, navigation, and development.

Outlook

The Unprecedentedly Good Outlook for Irrigation in 1918 (83503 A). F. W. Park. Ills. 1500 w. Mun Eng—Jan., 1918. Increase in production due to irrigation, and the possibilities.

Philippines

Philippine City's Lowland Raised by Harbor Dredging (83204). W. C. A. Palmer. Ills. 1200 w. Eng News-Rec—Dec. 27, 1917. Property in Iloilo developed by selling fill to private owners and by creating public areas.

Porous Soils

Border Method of Irrigation for Porous Soils (88234). R. W. Allen. From

IRRIGATION AND RECLAMATION**Rio Grande**

circular of Oregon Agri. College Ex. Station. 1700 w. Eng & Con—Aug. 4, 1918. Explains method and preparation of land.

Pumping

Operating Features of a California Pumping Project (89294). Ills. 1500 w. Elec Rev, Chi—Oct. 5, 1918. Terra Bella irrigation system operated entirely by motor-driven pumps.

Pumping Engines for the Cairo Main Drainage (89327 A). Ills and Plate. 2500 w. Engng—Sept. 6, 1918. Details of the mechanical equipment of the main pumping station and pumping engines.

Methods and Costs of Pumping for Irrigation in Arkansas River Valley (87478). From bulletin prepared by J. B. Marcellus. 2000 w. Eng & Con—July 10, 1918.

Irrigazione Con Sollevamento Meccanico (85869 B). C. Fadini. Ills. 1400 w. L'Industria—Feb. 28, 1918. Irrigation in Italy with electrically driven centrifugal pump system.

Reclamation

Reclamation of Swamp Lands in Virginia-Carolina Adding to Nation's Food Supply (87481). F. W. McKinney. 2000 w. Mfrs Rec—July 11, 1918. How these swamps are reclaimed.

Land Reclamation Would Provide Work and Homes for Hosts of Veterans (88320 A). Arthur P. Davis. 3000 w. Eng News-Rec—Aug. 22, 1918. Irrigation and drainage of 20,000,000 acres would care for a million families in agricultural and allied pursuits.

Vast Scheme of Land Reclamation Proposed by Secretary Lane (87044). 2000 w. Eng & Con—June 19, 1918. Abstract of a letter to the President suggesting work to meet the requirements of returning soldiers.

Reconstruction

Wooden Trestle Replaced Piecemeal by Concrete Structure (86046). Ills. 700 w. Eng News-Rec—May 2, 1918. Work in San Joaquin irrigation district.

Reservoirs

Tumalo Irrigation Storage Reservoir Leaked Profusely and Erratically (85732). J. P. Newell. Ills. 2500 w. Eng News-Rec—April 18, 1918. Lessons from the history of the Tumalo irrigation project in the state of Oregon.

Rio Grande

Big Returns from Irrigation in Lower Valley of the Rio Grande (86539). W. D. Hornaday. Ills. 1200 w. Mfrs Rec—May 23, 1918. Results from reclaimed land.

Run-off

Peak Run-off Data on Restricted Dry-Wash Channel (88957 A). Ills. 1000 w.

MATERIALS OF CONSTRUCTION**Ceramics**

Eng News-Rec—Sept. 19, 1918. Records taken at Lytle Creek, California, in Jan.

MATERIALS OF CONSTRUCTION**Aggregates**

Slag as an Aggregate for Concrete Ships (87618 A). Curtis C. Myers. Ills. 1800 w. Iron Age—July 18, 1918. Comparison with crushed stone or pebble concretes puts slag in place of superiority.

An Abrasion Test for Stone, Gravel, and Similar Aggregates (87037 N). H. H. Scofield. Ills. 9 pp. Am Soc Test Mat—June, 1918. Describes apparatus aiming to furnish a simpler machine and a more rapid and practical test.

Proportioning the Materials of Mortars and Concretes by Surface Areas of Aggregates (87036 N). L. N. Edwards. Ills. 48 pp. Am Soc Test Mat—June, 1918. Information for securing uniformly strong mortars and concretes.

Asphaltic Materials

Bituminous Sands of Northern Alberta (84524 N). S. C. Ellis. Ills. 3000 w. Can Min Inst, Trans—1917. Undeveloped deposits and their economic importance.

Australian Hardwood

The Lightest Beams of Australian Hardwood to Carry Various Loads (84-132 N). George Higgins. 800 w. Comwv Engr—Jan., 1918. How to ascertain the most economical sections for timber beams.

Brick

Brick Used as a Means of Interior Decoration (88542 B). H. B. Russell. Ills. 1200 w. Arch For—Aug., 1918. Details of the city house of E. H. Noyes, Boston.

The Manufacture of Silica Brick (88771 D). H. Le Chatelier and B. Bogitch. Ills. 28 pp. A I M E, Bul—Sept., 1918. Methods of investigation of the conditions for the manufacture of high-grade brick.

Composition of Refractory Silica Brick (86527). J. S. McDowell. 2000 w. Eng & Min JI—May 25, 1918. Changes in composition undergone by silica brick in the burning process.

Building Stones

Report on the Building and Ornamental Stones of Canada (88708 N). William A. Parks. Ills. 225 pp. Can Dept Mines—No. 452. Account of the stones occurring in British Columbia.

Burma

The Material Resources of Burma (89000 N). Harvey Adamson. Map. 39 pp. Imp Inst, Bul—Jan.-March, 1918. In-

formation showing Burma to be a land of rich resources.

Cements

Some Generalizations on the Influence of Substances on Cement and Concrete (85532 N). J. C. Witt. 20 pp. Phil JI Sci—Jan., 1918. A study of investigations, giving tabulated results.

Specifications and Methods of Tests for Portland Cement (82942 D). Ills. 19 pp. A S C E, Pro—Nov., 1917. Recommended by Joint Conference on Uniform Methods of Tests and Standard Specifications for Cement.

Fabrique De Ciment Portland (85-124 B). Ills. 2500 w. Le Génie Civil—Feb. 2, 1918. French establishment making Portland cement near Marseilles.

Crystalloids Against Colloids in the Theory of Cements (86516 N). Henry Le Chatelier. 2000 w. Faraday Soc—Jan., 1918. A study of the problem.

Is the Setting of Cement Mainly a Physical or a Chemical Process? (86520 N). John G. A. Rhodin. 1000 w. Faraday Soc—Jan., 1918. Investigations.

The Mechanism of the Setting Process in Plaster and Cement (86515 N). Cecil H. Desch. 3000 w. Faraday Soc—Jan., 1918. Examines hypotheses and the evidence adduced in their support, indicating the nature of discrepancies.

The Setting of Cement in Its Relation to Engineering Structures (86519 N). Bertram Blount. 1300 w. Faraday Soc—Jan., 1918. Theory and practical aspect.

The Effect of Calcium Sulphate on Cement (83782 N). J. C. Witt and F. D. Reyes. 2000 w. Phil JI Sci—May, 1917. Research work to determine the effect of various amounts of calcium sulphate on several cements.

Cement Works

Description of the Works of White's South African Cement Company, Limited (84982 N). H. Campbell, with discussion. 7500 w. So Af Inst Engrs, JI—Jan., 1918. Works at Ventersburg Road, Orang Free State.

Ceramics

Ceramics and the War (84723 A). Edward W. Washburn. 2500 w. Met & Chem Eng—March 1, 1918. Problems confronting the country in the field of ceramics.

MATERIALS OF CONSTRUCTION

Concrete

Colloids

The Colloidal State of Matter in Its Relation to the Asphalt Industry (82763 A). Clifford Richardson. 4000 w. Met & Chem Eng—Dec. 1, 1917. On the colloids of asphalts and related materials. Read before St. Paul Eng. Soc.

Concrete

Effects of Grading of Sands and Consistency of Mix Upon the Strength of Concrete (87688). Llewellyn N. Edwards. Ills. 1200 w. Can Engr—July 18, 1918. Read before Am. Soc. for Test. Mat. Strength developed between ages of ninety days and one year cannot be predetermined.

Permeability of Concrete by Water (87498 N). B. J. Smart and A. Morrison. Read before Eng. Assn. of N. S. W. Ills. 2500 w. Comwñ Engr—May, 1918. Concludes that concrete can be made watertight, but doubts whether it can be economically accomplished.

The Basic Principle of Concrete Mixes (87421). Duff A. Abrams. 1000 w. Min & Sci Pr—July 6, 1918. Experimental data showing increase in strength from proper proportioning.

Chemistry of Concrete (88664). Arch. Blackie. Read before the Engng. Inst. of Canada. 2500 w. Can Engr—Sept. 5, 1918. Causes of disintegration.

Concrete in Alkali Soil at Saskatoon (88661). H. McI. Weir. Read before Engng. Inst. of Canada. 2000 w. Can Engr—Sept. 5, 1918. Damage to structures caused supposedly by the action of alkali.

Discussion on Final Report of the Special Committee on Concrete and Reinforced Concrete (88740 D). 7 pp. A S C E, Pro—Aug., 1918. Continued from Feb. issue.

Weighing Concrete Materials Saved Cement on Three Big Dams (88479 A). H. H. Hunt. Ills. 2000 w. Eng News-Rec—Aug. 29, 1918. Proportioning by weight gave better concrete with less cement and without loss of speed.

Concrete in Western Canada (85811). J. F. Greene. Read before Manitoba Br. of Can. Soc. Civ. Engrs. 3500 w. Can Engr—April 18, 1918. The deterioration of concrete under the action of alkali waters.

Frozen Concrete in Floor Slab Has Low Tested Strength (82312). Sanford E. Thompson. Ills. 800 w. Eng News-Rec—Nov. 8, 1917. Shows upper half with frost marks and low strength while lower half is normal.

Prime Factors in Making Concrete (82685 B). R. W. Crum. 1000 w. Iowa Eng Soc, Pro—Feb., 1917. Factors demanded for good quality.

Notes on the Uses of Concrete (83179). A. E. Eastman. Ills. 1800 w. Can Engr—Dec. 20, 1917. Advantages and disadvantages of various uses.

Effect of Alkali Soils on Concrete (86165). J. F. Greene. Abstract of paper before Can. Soc. of C. E. 1000 w. Eng & Con—May 8, 1918. Discussion with special reference to conditions in Western Canada.

Permeability of Concrete by Water (86348 A). B. J. Smart and A. Morrison. Read before Eng. Assn. of N. S. W. Ills. 2500 w. Aust Min Stan—Apr. 18, 1918. Report of tests, with review of work carried out by Wig and Bates.

Revolutionary Results Obtained by Proportioning Water in Concrete Tests (86047). Duff A. Abrams. 1500 w. Eng News-Rec—May 2, 1918. Importance of ratio of water to cement.

The Logical Proportioning of Concrete Aggregate (83803 A). Joel D. Justin. 17 pp. Corn C E—Dec., 1917. Explains a method of proportioning and its advantages and disadvantages.

Effect of Time of Mixing on the Strength of Concrete (87977). Duff A. Abrams. Ills. 4000 w. Can Engr—July 25, 1918. Serial, 1st part. Tests show that inferior concrete is produced by undermixing but excess of water is the greater evil. Read before Am. Concrete Inst.

Lukewarm Concrete Enough Precaution for Zero Weather Dam Work (88082 A). Ills. 1200 w. Eng News-Rec—Aug. 8, 1918. Perfect bond and sound concrete secured by placing 50°

Notes on the Condition of Some Unmixture on frozen surfaces.

derground Concrete Work in Winnipeg (88339). Bertram Stuart McKenzie. Ills. 2500 w. Can Engr—Aug. 22, 1918. Read at Saskatoon meeting of Eng. Inst. of Canada. Examples of deterioration.

Oil and Concrete (87882 A). 4500 w. Ry Engr—July, 1918. Serial, 1st part. Conditions under which oil may affect concrete.

Relation of Stone Aggregate Content to the Compressive Strength of Concrete (88338). Llewellyn N. Edwards. 800 w. Can Engr—Aug. 22, 1918. Tests indicate that 20 per cent. of stone reduces strength of mortar by 3 per cent., while 40 per cent. of stone reduces it by 11 per cent.

Some Tests on the Effect of Age and Condition of Storage on the Compressive Strength of Concrete (88147). Harrison F. Gonnerman. 2000 w. Can

Concrete Lumber MATERIALS OF CONSTRUCTION

Lime

Engr—Aug. 8, 1918. Read before Am. Concrete Inst.

The Basic Principle of Concrete Mixes and the Truly Fundamental Role Played by Water (87798). Duff A. Abrams. 1500 w. Eng & Con—July 24, 1918. Studies showing the injurious effects of too much water.

Concrete Lumber

Precast Concrete Lumber Proves Successful in Mine (89252 A). Ills. 2000 w. Eng News-Rec—Oct. 3, 1918. Fire resistivity sought. Costs about twice as much as timber.

Concrete Piles

Discussion of "The History and Present Status of the Concrete Pile Industry" (82900 B). Ills. 45 pp. Bos Soc C E, Jl—Nov., 1917. Discussion of Charles R. Gow's paper.

Conservation

The Conservation of Material (82402 A). M. K. Barnum, with discussion. Ills. 26 pp. N Y Rd Cb, Pro—Oct. 19, 1917. Deals with reclamation and preservation and gives examples of work and results.

Conservation (83222 A). J. P. Murphy, with discussion. Ills. 35 pp. Cen Ry Cb—Nov. 9, 1917. Calls attention to waste, particularly railway materials.

Corrosion

Roesten van het ijzer in gewapend beton (85856 B). J. A. Bakker. Ills. 4200 w. Ingenieur—Mar. 2, 1918. Corrosion of iron in reinforced concrete. Illustrations from existing structures and recommended practise for prevention.

Corrugated Culverts

The Use and Abuse of Corrugated Culverts (88160 D). A. F. Rushton. 1500 w. Okla Soc Engrs, Trans—Vol. IV, 1918. Failures due to improper construction or installation.

Cotton Baling

Cotton Baling and Sampling (83073 A). Ills. 800 w. Engr—Nov. 23, 1917. Detailed description of a horizontal cotton baling press, and a machine for taking merchant samples.

Fertilizers

Fertilizers (84981 N). Allan Baguley, with discussion. 12 pp. Chem, Met & Min Soc of S. Af., Jl—Nov., 1917. How to increase the productive power of the soil.

Fireproofing

Report of Committee C-5 on Fireproofing (85080 N). 16 pp. Am Soc Test Mats, Pro—June, 1917. Report of tests, with discussion.

Flumes

Precast Concrete Slabs Make Durable

Flume (87628). S. L. Stovall. Ills. 1000 w. Eng News-Rec—July 18, 1918. Construction found to be cheap and simple.

Forestry

National Forestry Scheme (84019 A). 1500 w. Colly Gdw—Jan. 11, 1918. Scheme urged by Forestry Sub-Committee of the Reconstruction Committee of the United Kingdom.

Fuel

Is Our Fuel Supply Nearing Exhaustion? (85571 A). R. H. Fernald. Ills. 7500 w. E Cb Phila, Jl—April, 1918. Amount of reserves; demands; need of conservation, etc.

Ferro-Alloys

New York Section War Meeting on Ferro-Alloys (82497 D). 12 pp. A I M E, Bul—Nov., 1917. Address on "Chrome Mining and Concentration," by C. S. Newcomb, with short addresses by W. B. Driver, S. H. Ball, and G. K. Burgess.

Glass Sand

Optical Lens Manufacture Possible Using Glass Sand of West Virginia (83344). R. W. Stone. Ills. 2500 w. Mfrs Rec—Jan. 3, 1918. Analyses of glass sand from Berkeley Springs, W. Va.

Hollow Tile

Report of Committee C-10 on Hollow Building Tile (85082 N). 28 pp. Am Soc Test Mats, Pro—June, 1917. Organization, scope of work, and progress made.

Household Materials

Materials for the Household (83655 A). Ills. 245 pp. U S Bur Stds, Circ. 70—Dec. 5, 1917. Describes the more common materials, other than food and drugs, used in the home; their quality and use.

Hydraulic Cement

Hydraulische Mortelmateriellen (85148 B). A. E. Dinger. Ills. 10,000 w. Ingenieur—Feb. 9, 1918. History, constitution and applications of hydraulic cements.

Inspection

Outline of Methods of Inspection of Materials for Subway and Elevated Lines in New York City (88970 B). George L. Lucas. 5000 w. Mun Engrs, Jl—May-June, 1918. Methods, quantities, cost, etc.

Lead Wool

Lead Wool (85675 N). R. J. Thomas. 2000 w. Am Wr Wks Assn, Jl—March, 1918. Material for calking joints in cast iron pipes, and other uses.

Lime

The Valuation of Lime for Various

Lime Plant MATERIALS OF CONSTRUCTION Reinforced Concrete

Purposes (84765 B). Richard K. Meade. 4000 w. *Jl Ind & Eng Chem*—March, 1918. Outlines methods generally employed for chemical analysis of lime.

Lime Plant

Features of Modern Lime Plant at Kingsport, Tennessee (84778). Ills. 1500 w. *Mfrs' Rec*—March 7, 1918. Detailed description.

Lubricants

Report of Committee D-2 on Lubricants (85083 N). 8 pp. *Am Soc Test Mats, Pro*—June, 1917. Report of continued work on tests.

Masonry

Guatemala Earthquakes Destroyed All Masonry Buildings (89251 A). Edward Stuart. Ills. 2000 w. *Eng News-Rec*—Oct. 3, 1918. Wood and concrete frames stood shocks well.

Metals

Metals and Metallurgical Research (84-533). S. F. Kirkpatrick, in *Queens Quarterly*. 2000 w. *Can Min Jl*—Feb. 15, 1918. Importance of research; increased use of alloys, etc.

Mortar

Ancient and Modern Mortar (86522 N). W. J. Dibdin. 1700 w. *Faraday Soc*—Jan., 1918. A comparison.

Natural Resources

Report of Committee XIX—On Conservation of Natural Resources (84477 N). 20 pp. *A R E A, Bul*—Dec., 1917.

Niter Cake

A Summary of the Proposals for the Utilization of Niter Cake (86764 B). John Johnston. 3500 w. *Jl Ind & Eng Chem*—June, 1918. Shows the possibilities of its utilization.

Nomenclature

Report on British Standard Nomenclature of Bituminous Materials (85084 N). 6 pp. *Am Soc Test Mats, Pro*—June, 1917. Definitions, remarks, etc.

Paint

Selecting an Economic Paint (88507). Robert Job. 1500 w. *Eng & Con*—Aug. 28, 1918. From a lecture at McGill Univ. Influence of size of pigment particles; paint specifications and testing.

Piling

Durability of Untreated Piling Above Mean Low Water (85033). Mabel E. Thorne and C. H. Teasdale. 2500 w. *Eng & Con*—Apr. 24, 1918. A study by the questionnaire method, made by the Forest Products Laboratory.

Pipe

Reinforced Concrete Pipe (85762 B). George C. Bartram. Ills. 20 pp. *Mun Engrs Jl*—April, 1918. Reviews the devel-

opment; method of manufacture; tests, etc.

Portland Cement

Properties of Portland Cement Having a High Magnesia Content (84873). P. H. Bates. Ills. 40 pp. *U. S. Bur Stds, Tech paper* 102—Jan. 19, 1918. Investigation to determine the effects of increasing the magnesia content.

The Constitution and Hydration of Portland Cement (86517 N). A. A. Klein. 4500 w. *Faraday Soc*—Jan., 1918. A study and review of the subject.

The Effect of the Addition of Suitable Slag on the Setting Properties of Portland Cement (86521 N). E. Deny and E. H. Lewis. 1200 w. *Faraday Soc*—Jan., 1918. Research work.

The Setting and Hardening of Portland Cement (86518 N). G. A. Rankin. 3000 w. *Faraday Soc*—Jan., 1918. The constitution of Portland cement clinker, discussing the hydration of the constituents.

Railway Material

Conservation and Reclamation of Material (82328). M. K. Barnum, with discussion. Read before the N. Y. Ry. Club. 3400 w. *Ry Age Gaz*—Nov. 9, 1917. Means by which the service of railway material may be increased.

Refractories

Fireclays and Ganisters of the South of Scotland (85783 A). L. W. Hinxman. Read before Ceramic Soc., Glasgow. 4500 w. *Quarry*—April, 1918. Deposits used in the manufacture of high-class refractory goods.

Regulations

Priority Regulations for Railway Materials (82210). 2500 w. *Ry Age Gaz*—Nov. 2, 1917. System of priority to determine the relative precedence in which orders shall be filled.

Reinforced Concrete

Effect of Fire on the Flat Slab Building of the Quaker Oats Co., Peterboro, Ont., Dec. 11, 1916 (83807 B). T. D. Mylrea, with discussion. Ills. 38 pp. *West Soc Engrs, Jl*—Oct., 1917. Studies the effect of the fire on this reinforced concrete flat slab construction.

Reinforced Concrete Theory Without the Aid of Formulas (86283 A). Charles A. Ellis. 4000 w. *Eng Ed*—April, 1918. Serial, 1st part. Explains how a course in the theory might be conducted.

Reinforced Concrete versus Salt, Brine and Sea-Water (88046 N). Henry Jermain Maude Creighton. 4400 w. *Faraday Soc*—July 23, 1918. Deals chiefly with the corrosion of iron reinforcements of concrete due to the action of brine.

Resources

MATERIALS OF CONSTRUCTION

Slabs

A New System of Reinforcement, and Some Uses of Concrete and Cement in Mining (84935 N). W. Marriott, with discussion. 3000 w. Instn Min Engrs, Trans—Jan., 1918. Deals with reinforced-concrete pit-props and bars and the uses of concrete and cement in mining.

Report of Committee C-2 on Reinforced Concrete (85079 N). 92 pp. Am Soc Test Mats, Pro—June, 1917. Final report on concrete and reinforced concrete with discussion.

The Deteriorating Action of Salt and Brine on Reinforced Concrete (82457 B). Henry Jermain Maude Creighton. Ills. 16 pp. Fkn Inst, Jl—Nov., 1917. Account of observations and conclusions.

Resources

Our Resources (83595 A). G. W. Thompson. 4500 w. Met & Chem Eng—Jan. 1, 1918. Presidential addresses delivered at the St. Louis meeting of Am. Inst. of Chem. Engrs. Ability to use material resources.

Rock Products

The Preparation of Rock Products (83137 B). Raymond W. Dull, with discussion. Ills. 12 pp. West Soc Engrs, Jl—Sept., 1917. Proper methods to use with particular reference to washing and sizing.

Roofs

The Heat-Insulating Value of Roofing Materials (82285 A). W. M. Thornton. 1200 w. Engng—Oct. 19, 1917. Report of tests.

Roofing

Sheet Zinc for Roofing (89274 A). W. H. Seamon. Ills. 7000 w. Eng & Min Jl—Oct. 5, 1918. Uses and details of construction.

Rope Slicing

Splicing Wire Rope (88153). Abstract from "Lescheus Hercules." Ills. 800 w. West Eng—Aug., 1918. Tools required and methods described.

Rubber

War Problems of the Rubber Industry (89324 A). Andrew H. King. 2000 w. Chem & Met Eng—Oct. 1, 1918. How United States manufacturers met the rubber shortage.

Rubber Chemistry

Catalysts in Vulcanization (84103 B). D. Spence. 2500 w. Jl Ind & Eng Chem Feb., 1918. Account of results obtained in America.

Vulcanization of Rubber by Selenium (84104 B). Charles R. Boggs. 1200 w. Jl Ind & Eng Chem—Feb., 1918. Research work and results.

Salvage

Possibilities of Salvage and Utilization of Waste (89626). David Currie. 2500 w. Can Engr—Oct. 17, 1918. Address at conference of Inst. of Cleansing Supts. The urgent need and possibilities.

Sampling

The Sampling of Deposits of Road Stone and Gravel in the Field (87038 N). L. Reinecke and K. A. Clark. 20 pp. Am Soc Test Mat—June, 1918. Studies upon variations in the road-making qualities of bed rock, boulder aggregates, and gravel.

Sands

Progress Report of Committee on Mechanical Analysis of Sands (88932 N). 10 pp. Am W-Wks Assn, Jl—Sept., 1918.

Sandstones

Test of Some Canadian Sandstones to Determine Their Suitability as Pulpstones (82509 N). L. Heber Cole. Ills. 16 pp. Can Dept Mines—Bul. No. 19. To determine their suitability for use as wood pulp grinders.

Sewer Pipe

Manufacture of Sewer Pipe (84535). Frank Coleman. Read before Can. Clay Products Assn. 4000 w. Can Engr—Feb. 21, 1918. Facts worthy consideration.

The Supporting Strength of Sewer Pipe in Ditches and Methods of Testing Sewer Pipe in Laboratories to Determine Their Ordinary Supporting Strength (83642 N). A. Marston, W. J. Schlick, H. F. Clemmer. Ills. 56 pp. Iowa State College, Bul. 47—Oct. 10, 1917. Discussions, tests and conclusions.

Vitrified Clay Sewer Pipe (84686). A. R. Duff. 2000 w. Can Engr—Feb. 28, 1918. Abstract from 1916 Report of the Provincial Board of Health, Ontario.

Silica Brick

The Manufacture of Silica Bricks (84837 A). H. Le Chatelier and B. Bogitch, in *Comptes Rendus*. 1500 w. Colly Gdn—Feb. 22, 1918. Study of the physical and chemical constitution.

Slabs

Some Notes on Flat Slab Design: Bending Moments, Exterior Panels, Spandrels, Arrangement of Reinforcement (85295). Albert M. Wolf. Diagrams. 3500 w. Eng & Con—March 27, 1918. Critical discussion of the Chicago Rulings and the Concrete Institute recommendations.

Slag

Molten Slag is Hauled by Rail for Making Embankments (88084 A). Ills. 2000 w. Eng News-Rec—Aug. 8, 1918. Work at Pittsburgh along the Monongahela River.

MATERIALS OF CONSTRUCTION

Wood Waste

Steel Columns

Final Report of the Special Committee on Steel Columns and Struts (83-273 D). Ills. 50 pp. A S C E, Pro—Dec., 1917.

Stonework

A Stonework Destroying Fungus (82574 A). James Scott. Ills. 1500 w. Ry Engr—Nov., 1917. Describes species.

T-Beams

Reinforced Concrete T-Beam Design and Investigation (86285 A). W. C. Huntington. 3500 w. Univ Col JI Eng—April, 1918. Deals primarily with moment calculations. Diagram and formulas.

Timber

American Forestry Units Are Working Fifty-three Tracts of French Timber Land (89126 A). Robert K. Tomlin, Jr. Ills. 2000 w. Eng News-Rec—Sept. 26, 1918. Big organization of trained men is relieving wood shortage for army construction purposes.

Economics of Pole Timber (89173). Ernest F. Hartman. Ills. 2000 w. Elec Wld—Sept. 28, 1918. Life of poles doubled by preservative treatment.

Fungi, the Cause of Decomposition of Timber (89221 A). P. H. Dudley. Ills. 5000 w. Wood Presg—July-Sept., 1918. Brief details of the life history of trees and of fungi. Timber preservation.

Position and Prospects of the Home Timber Supply (88401). E. P. Stebbing. 2200 w. Nature—July 18, 1918. Complete destruction of British wood supply for war purposes. Other sources suggested.

Moisture Effects on Fir and Pine (87191 A). Irving H. Cowdrey. 3500 w. Mar Rev—July, 1918. Air dried timber reabsorbs moisture rapidly, and strength is reduced as moisture increases.

Timber Industry (87698 A). Percy Groom, with discussion. 12 pp. Roy Soc Arts, JI—July 5, 1918. Deals with the extent to which technical science can aid in promoting this industry, and the utilization of the timber resources of the British Empire.

The Artificial Seasoning of Wood (85756). Percy Groom, with discussion. Read before Inst. of Auto. Engrs. 6000 w. A A Wkly—April 22, 1918. Construction of wood-drying, shrinkage, warping, seasoning, etc.

Effect of Moisture Reabsorption on Compressive Strength of Air-Dried Timber (86186 A). Irving H. Cowdrey. (Abstract.) 4000 w. A S M E, JI—May, 1918. Investigations and conclusions.

Victorian Forests and Their Manage-

ment (86347 A). Ills. 1300 w. Aust Min Stan—Apr. 18, 1918. Serial, 1st part. Primary needs of the timber industry.

Timber Preservation

The Preservation of Wood in Connection with the Building of Wharves and Docks (85597 A). Hermann von Schrenk. Ills. 2500 w. Int Mar Engr—April, 1918. Advantages of the creosoting process.

Relative Resistance of Various Hardwoods to Injection with Creosote (87691). Ills. 4500 w. Ry Rev—July 20, 1918. Details and results given in a paper by Clyde H. Teesdale and J. D. MacLeon, published as Bul. 606, U. S. Dept. of Agriculture.

Field Tests Made on Oil Treatment of Wood Against Marine Borers (82202). C. H. Teasdale and L. F. Shackell. Ills. 3000 w. Eng News-Rec—Nov. 1, 1917. Studies of creosote oil protection on specimens immersed six years indicate need for high boiling oils.

Waterproofing

Integral Waterproofing for Concrete (82420 A). S. B. and A. C. Newberry and H. C. Morrison. 2500 w. E Cb St L, JI—Sept.-Oct., 1917. Methods and their value.

Wood

The Afforestation Question in Britain (89061 A). E. P. Stebbing. 1100 w. Nature—Aug. 15, 1918. Britain's timber supply and its use in war. Tree planting.

Wooden Containers

The Use of Wood in Chemical Apparatus (86302 A). A. W. Schorger. 3500 w. Met & Chem Eng—May 15, 1918. Results of an inquiry by the Forest Products Laboratory regarding experience with wooden containers.

Wood Preservation

Economic Importance of Wood Preservation (82909). Kurt C. Barth. Ills. 2500 w. Eng & Min JI—Dec. 8, 1917. Steps leading to the successful application of methods.

Report of Committee XVII—On Wood Preservation (85034 C). 16 pp. Am Ry Eng Assn, Bul—March, 1918. With experiments and notes by W. H. Courtenay and by S. R. Church.

Wood Waste

Manufacture of Ethyl Alcohol from Wood Waste (89334 A). 2500 w. Engr—Sept. 6, 1918. Reviews the history of past efforts and describes the present process, giving uses of ethyl alcohol.

Wood-Waste as a Source of Ethyl Alcohol (89318 A). George H. Tomlinson. 3500 w. Chem & Met Eng—Oct. 1, 1918. Technical problems solved. Costs at Fullerton, La.

MEASUREMENT

Earth-Pressure

Arches

Description of a Machine to Test the Actual Horizontal Thrust of Model Arches (87514 N). Edward Waller Stoney. Ills. 1800 w. Instn C E Ireland, Trans—Vol. XLIII, 1918. Details of machine and experiments made.

Experiments on the Strength of Thin Brick Arch Ribs (87515 N). Edward W. Stoney. Ills. 32 pp. Instn C E Ireland, Trans—Vol. XLIII, 1918. Experiments made to test the actual strength and stiffness of arch ribs of sufficient size to roof houses.

Calcul Des Voutes En Beton Armé (85859 B). L. R. De La Mahotière. Ills. 3200 w. Le Génie Civil—Mar. 23, 1918. Calculation of the strength of reinforced concrete arches.

Beams

The Design of Offset Beams (88688 A). Victor M. Summa. Ills. 1000 w. Ry Mech Engr—Sept., 1918. Discusses proper methods.

Influence Lines for Continuous Beams (84838 A). G. R. Magnel. Ills. 2000 w. Engng—Feb. 15, 1918. States the problem and explains how it can be solved with theoretical accuracy in a few minutes.

Equivalent Uniform Loads for Reinforced Concrete Beams (87200). Albert J. Becker. 1500 w. Eng & Con—June 26, 1918. Method of determining maximum bending moment of equivalent uniform loads.

Graphical Determination of Beam Deflections (82892). Jesse B. Koppers. Ills. 1500 w. Wis Engr—Nov., 1917. Works out numerical problems for the common cases of beam loading.

Beam Stresses

Distribution of Internal Work in Beams and Slabs (88578 A). Henry T. Eddy. 1600 w. Eng News-Rec—Sept. 5, 1918. Difference in amounts of energy stored in steel indicates dissimilarity in structural functions of concrete.

Breakwater

Mur De Quai Nord Du Môle A Alger (88433 C + D). M. Gauckler. Ills. 6000 w. Ann Ponts Et Chaussées—Mar.-Apr., 1918. Movements of a pier wall at Algiers. Measurements of vibration and settlement.

Bridge Maps

Method of Numbering County Bridges and Making Bridge and Drainage Map (88508). J. C. McLean. 1000 w. Eng & Con—Aug. 28, 1918. Outline of methods.

Bridge Testing

On the Testing of Metallic Bridges (84668 A). Ills. 3000 w. Ry Engr—Feb., 1918. Serial, 1st part. Translated from Prof. Jules Gaudard's work entitled "Croquis de Ponts Metalliques."

Chimneys

Vibration of Reinforced Concrete Chimneys (87716 N). F. Omori. Ills. 4700 w. Earthquake Committee—Bul 1, Vol. IX. Results of research undertaken for Imperial Japanese Earthquake Investigation Committee.

Columns

Discussion on Final Report of the Special Committee on Steel Columns and Struts (89657 D). 19 pp. A S C E, Pro—Oct., 1918. Continued discussion.

Tests of Large Bridge Columns (87556 A). J. H. Griffith and J. G. Bragg. Ills. 135 pp. U S Bur Stds, No. 101—June 27, 1918. Gives a comparative analysis of the experimental data found upon 18 large bridge columns.

Low Working Stress for Square-End Steel Columns is Recommended (84113). 3000 w. Eng News-Rec—Feb. 7, 1918. Final committee report of Am. Soc. of Civ. Engrs., with editorial.

Long Columns Carrying Distributed Loads (83066 A). Arthur Morley. 2000 w. Engng—Nov. 30, 1917. Considers Mr. Koga Kato's method of solution and his results; also explains a method the writer has used.

Dams

Déversoirs Noyés (87717 C + D). G. Mouret. Ills. 8000 w. Annales Des Ponts Et Chaussées—Nov.-Dec., 1917. Graphic representation of relations deduced by experiment on flow of water over dams. Mathematical treatment and formulas.

Differentiation

The Application of Mechanical Differentiation to Engineering Problems (84375 B). Armin Elmendorf. 1700 w. Fkn Inst, JI—Feb., 1918. Application to train resistance, electric car efficiency, air resistance to flight, stresses in beams, girders and slabs, etc.

Earth Dams

Tests to Determine Pressures Due to Hydraulic Fills (85735). A. W. Goldbeck. Ills. 2000 w. Eng News-Rec—April 18, 1918. Method of measuring stability of dikes against thrust of clay core.

Earth Pressure

Computing the Lateral Pressure of Saturated Earth (88574 A). A. G. Husted. Ills. 1500 w. Eng News-Rec—Sept. 5,

Flat Slab

1918. Proposed method takes account of separation of hydrostatic from earth pressure, but allows full hydrostatic pressure.

Experiments on Earth-Pressures (87468 N). Ponsonby Moore Crosthwaite, with abstract of discussion. Ills. 87 pp. Instn C E, Pro—Dec. 19, 1916. Report of experimental investigations.

Flat Slab

Simple Formulas for Rapid Design and Estimates of Flat Slab Based on the Last Joint Committee Report on Concrete and Reinforced Concrete (83847). M. W. Serby. 700 w. Eng & Con—Jan. 23, 1918. See also page 45.

Floors

Computing Moments on Irregularly Spaced Flat-Slab Panels (85465). W. Stuart Tait. 1500 w. Eng News-Rec—April 4, 1918. Analyzed by using three-moment theorem.

Floor Test

Test of Reinforced Concrete Floor in the Western Newspaper Union Building, Chicago (82718). Jos. E. Love. Ills. 1200 w. Eng & Con—Nov. 28, 1917. Account of test-covering three weeks and costing about \$3,000.

Graphics

Graphical Method of Finding Moments in Continuous Frames of a Girder and Two Fixed Columns (83845). W. S. Wolfe. Ills. 1500 w. Eng & Con—Jan. 23, 1918. Explains method of solving such problems.

Gravel Screens

Comparative Analysis of Gravel Screens (87622). Raymond W. Dull. Ills. 1800 w. Eng & Con—July 17, 1918. Types are described and analyzed.

Hardness

Two Field Methods for the Determination of the Total Hardness of Water (85531 N). A. S. Behrman. 2000 w. Phil J1 Sci—Jan., 1918. Details of methods and results.

Hell Gate Bridge

Stress Measurements on the Hell Gate Arch Bridge (85924 D). Ills. 3500 w. A S C E, Pro—April, 1918. Continued discussion of paper by D. B. Steinman.

Stress Measurements on the Hell Gate Arch Bridge (85323 D). Ills. 8 pp. A S C E, Pro—March, 1918. Continued discussion of D. B. Steinman's paper.

Impact

Impact—The Effect of Moving Loads on Railway Bridges (84329). W. S. Kinne. Ills. 2500 w. Wis Engr—Jan., 1918.

MEASUREMENT

Discussion of impact caused by unbalanced locomotive drivers. Damage caused, and how it may be avoided.

Latitude

Determination of Latitude and the Meridian (87855). A. C. Callen. 2000 w. Cl Age—July 25, 1918. Directions for using the transit to determine a meridian.

Levels

Estudio de los diversos Niveles del Ingenierio y sus perfeccionamientos (84-576 A). J. M. Lagomasino. Ills. 4200 w. Sociedad Cubana de Ingenieros Rev types of leveling instruments used by engineers.

Load Stresses

Equivalent Uniform Loads for Indeterminate Structures (87958 A). D. B. Steinman. Ills. 1500 w. Eng News-Rec—Aug. 1, 1918. Method worked out for ordinary trusses applied to curved influence lines.

"Mass"

The Much-Abused Term "Mass" in Engineering Calculations (82957 A). Carl Hering. 2500 w. E Cb Phila—Dec., 1917. Explanatory.

Melun

Note Sur L'Arche D'Essai De Melun (87721 C + D). M. Frontard. Ills. 8600 w. Annales Des Ponts Et Chaussées—Jan.-Feb., 1918. Experimental arch bridge, 246 ft. span, at Melun, France. Measurements and calculations.

Meridiograph

The Ross Meridiograph (85751). J. T. Beard. Ills. 1700 w. Cl Age—April 20, 1918. The instrument and its use.

Mine Surveys

The Magnetic Meridian and the Orientation of Mine Surveys (88603 A). W. B. H. Lockerbie. 3000 w. Colly Gdn—Aug. 9, 1918. Shows that very precise orientation can be made by means of the magnetic needle.

Mine Surveying

Terrestrial Magnetism in Relation to Mine Surveying (87355 A). C. Chree. From paper before Instn. of Min. Engrs. 4000 w. Colly Gdn—June 14, 1918. On the use of magnetic instruments, their accuracy, etc.

Navigation

The Search for Instrumental Means to Enable Navigators to Observe the Altitude of a Celestial Body When the Horizon is Not Visible (88725 A). G. W. Littlehales. Ills. 2500 w. U S Nav Inst, Pro—Aug., 1918. Describes methods and instruments invented.

Navigation

MEASUREMENT

Tunnels

Orifices

The Effect on Orifice and Weir Flow of Slight Roundings of the Upstream Edge (83804 A). Jacob O. Jones. Ills. 2200 w. Corn C E—Dec., 1917. This article gives investigations on orifices. Weir flow was dealt with in Nov. issue.

Piles

The Resistance of a Group of Piles (85067 B). H. M. Westergaard. Ills. 10 pp. West Soc Engrs, JI—Dec., 1917. A method of determining the distribution of pressure among any irregular group of piles.

Plane Table

A New Device for Tacheometric Plane-Table Surveying (87477 N). Henry Louis. 1000 w. Instn C E, Pro—Paper No. 4226. Description.

Roofings

Analysis and Testing of Prepared Roofings (82192 B). Herbert Abraham. Ills. 4000 w. JI Ind & Eng Chem—Nov., 1917. Considers prepared roofings manufactured from asphaltic compositions.

Shear Diagram

Shear Diagram for Bent-up Bars (82-721). Frank S. Bailey. 500 w. Eng & Con—Nov. 28, 1917. Simplified method of determining the value.

Soundings

Taking Soundings Above Niagara Falls from the Shore (89254 A). Leon R. Brown. Ills. 2500 w. Eng News-Rec—Oct. 3, 1918. Experimenting develops effective use of triangular float and weighted pole, controlled by cables.

Stored Energy

On the Distribution of the Energy Stored in Reinforced Concrete Beams and Column-Supported, Flat-Slab Floors (89593 B). Henry T. Eddy. 9 pp. Fkn Inst, JI—Oct., 1918. Shows the enormous difference between the storage of energy in beams and slabs, and that slabs cannot be computed by beam theory.

Structures

Structural Engineering (88609 A). 1800 w. Engng—Aug. 9, 1918. Editorial review of a paper by M. Charles Rabut, in *Rev. Gen. des Sci.* criticizing methods adopted for determining stresses.

Surface Waters

Ice Diversion, Hydraulic Models, and Hydraulic Similarity (85328 D). 11 pp. A S C E, Pro—March, 1918. Continued discussion of Benjamin F. Groat's paper.

Surveying

Problems in City Surveying (88986). William W. Perrie, with discussion. Ills. 2000 w. Can Engr—Sept. 19, 1918. Read

before Ontario Land Surveyors Assn. Classes of surveys. Differences of opinions.

Stadia Surveys in the West (88527). G. C. Cowper. 3500 w. Can Engr—Aug. 29, 1918. Water areas on the prairies, their classification, calculation, etc.

Calculo Del Error En Area Cometido Al Medir Una Finca (89058 A). J. M. Logomasino. Ills. 1900 w. Rev Soc Cubana de Ingenieros—Aug., 1918. Calculation of errors in determining area of land.

Photo-Surveying (82958 A). R. S. Swinton. Ills. 2500 w. Mich Tech—Dec., 1917. Methods; instruments; practice, etc.

Russian Engineers Make Intensive Hydrometric Survey in Crimean Upland (85466). D. Kotcherin. Ills. 700 w. Eng News-Rec—April 4, 1918. Outline of work.

Survey Monuments (84534). J. W. Pierce. Ills. 3000 w. Can Engr—Feb. 21, 1918. Permanent posts of iron, bronze, and concrete now supplanting buried tokens.

Surveys

Topographical Surveys in Connection With Rural Planning (88344). W. H. Norrish. 3500 w. Can Engr—Aug. 22, 1918. Extracts from paper before the Assn. of Dom. Land Survs. The advantages of topographical surveys, what they should show, cost, etc.

Survey Monuments

City Survey Monuments (83458). H. L. Seymour. Ills. 3500 w. Can Engr—Jan. 3, 1918. Reviews the practice of several Canadian cities.

Tank Volumes

Volumes of Cylindrical Tanks (87867). M. W. Ward. 900 w. Power—July 30, 1918. Means of finding the quantity of liquid in a given tank at any depth.

Tie Bar Tests

Tests on the Bars from the Menai Suspension Bridge (88287 A). Ills. 2500 w. Engr—July 19, 1918. Reports of tests of bars from a bridge completed in 1826 and more than 90 years in service, with remedial work undertaken.

Track Stresses

Progress Report of the Special Committee to Report on Stresses in Railroad Track (83897 D). Ills. 193 pp. A S C E, Pro—Jan., 1918.

Tunnels

Lines and Grades in Tunnels of Small Diameter (82901 B). Henry B. Pratt. Ills. 900 w. Bos Soc C E, JI—Nov., 1917. Method devised by which the instrument could be attached to the

Water Analysis

roof of the tunnel in an inverted position.

Survey Methods Used on the Wilson Avenue Tunnel, Chicago, Ill. (83138 B). H. W. Clausen. Ills & Plates. 12 pp. West Soc Engrs, Jl—Sept., 1917. Methods described.

Water Analysis

Water Analysis in the Field (85530 N). George W. Heise and A. S. Behrman. Plate. 17 pp. Phil Jl Sci—Jan., 1918. Outlines and discusses methods.

Water-Tester

Dionic Tester in Waterworks Service (86767). Joseph Race. Ills. 900 w. Can Engr—June 6, 1918. Its use in the detection of leakages from mains; the estimation of universal matter in natural waters; and the examination of distilled water.

Water Tests

A Small Water Works Testing Laboratory (85674 D). A. N. French, with discussion. 2000 w. N E W-Wks Assn—March, 1918. Details of apparatus and arrangement.

Weirs

Verification of the Bazin Weir Formula by Hydro-Chemical Gaugings (88736 D). 2500 w. A S C E, Pro—Aug., 1918. Continued discussion of paper by Floyd A. Nagler, Jr.

Verification of the Bazin Weir Formula by Hydro Chemical Gaugings (85322 D).

MEASUREMENT**City Managers**

2000 w. A S C E, Pro—March, 1918. Discussion of Floyd A. Nagler's paper.

Mitteilung über Versuche zur Verhütung von Kolken an Wehren (85863 B). H. E. Gruner and E. Locher. Ills. 2600 w. Schweiz. Bauzeitung—Jan. 19, 1918. Serial, 1st part. A study of pools of "dead water" in flumes and conduits.

Autographic Flow Curve for Any Weir (83223 A). Irving Porter Church. 1500 w. Corn C E—Nov. 19, 1917. Describes and demonstrates the design of an automatic appliance devised by the writer.

The Effect on Orifice and Weir Flow of Slight Roundings of the Upstream Edge (83224 A). Jacob O. Jones. Ills. 3000 w. Corn C E—Nov., 1917. Details of experimental investigations showing the effect on weir flow is comparatively small.

Verification of the Bazin Weir Formula by Hydro-Chemical Gaugings (86551 D). 20 pp. A S C E, Pro—May, 1918. Continued discussion of paper by Floyd A. Nagler, Jr.

Well Tests

Piezometers and Current Meters Used to Test Wells (88484 A). R. D. Klise. Ills. 1200 w. Eng News-Rec—Aug. 29, 1918. Flow records obtained and leaky casings located as part of water conservation work.

MUNICIPAL**Activated Sludge**

The Activated Sludge Experiments at Pasadena, Cal. (83524). Ills. 1500 w. Eng & Con—Jan. 9, 1918. Details of the plant and its operation.

The Fertilizing Value of Activated Sludge (86021 B). George G. Nasmith and G. P. McKay. Ills. 2800 w. Jl Ind & Eng Chem—May, 1918. Report of experiments showing it a most valuable fertilizer.

Some Conclusions Reached at Milwaukee on Treatment of Sewage by Activated Sludge Process (82884 A). 3500 w. Mun Eng—Dec., 1917. Results of observations and studies of the operation of the sewage testing station.

Conclusions on Activated Sludge Process at Milwaukee (82204). 5500 w. Eng News-Rec—Nov. 1, 1917. T. Chalkley Hatton discusses many features of sewage treatment work.

The Treatment of Packing-house Wastes by Activated Sludge Process (82422). Langdon Pearse. Read before Am. Pub. Health Assn. 2500 w.

Eng & Con—Nov. 14, 1917. Summary of experiments and results in Chicago.

Camps

Camp Management (86907 N). H. D. Symmes. 2500 w. Can Min Inst, Bul—June, 1918. Sanitation, management and handling of meat at labor camps.

Camp Sanitation (86880 B). W. P. Mason. 13 pp. Fkn Inst, Jl—June, 1918. Deals particularly with necessary precautions in labor camps.

City Building

Engineering Features of the Social Hall Ave. Development (86546 A). W. E. Turner. Ills. 2000 w. Utah Soc Engrs, Mthly Jl—March, 1918. Work in Salt Lake City in street planning, etc.

City Government

The Commission-Manager Plan of City Government (82648 B). O. E. Klingaman, with short discussion. 5000 w. Iowa Eng Soc, Pro—Feb., 1917. Outlines the proposed plan.

City Managers

Some Things Engineers Serving as City Managers May Be Expected to Meet (87-

City Planning

810 A). Thomas H. Reed. 2000 w. Eng News-Rec—July 25, 1918. Problems to be solved.

City Planning

City Planning for Small Municipalities (88988). A. Pearsons Hoover. Abstracted from address before City Managers' Assn. 1300 w. Can Engr—Sept. 19, 1918. Points of special importance.

The St. Louis Zone Plan (88878 A). Harland Bartholomew. Ills. 27 pp. E Cb St L, J1—July-Aug., 1918. Explanation of the building zone plan providing for three types of districts—height, area, and uses.

City Planning is Closely Related to Public Safety (89128 A). Thomas Adams and Harland Bartholomew. 2800 w. Eng News-Rec—Sept. 26, 1918. Extracts from paper read before Natl Safety Council. Illustrations from defective planning at St. Louis.

El Nuevo Plano De La Habana (87701 A). P. P. Gaston. 9900 w. Rev Soc Cubana De Ingenieros—June, 1918. Suggested scheme of city improvement of Havana by entirely new layout.

Sunlight Engineering in City Planning and Housing (87209 B). Herbert S. Swan and George W. Tuttle. Ills. 2500 w. Arch For—June, 1918. Gives data required for the application.

The Technical Mind and the City Plan (87585 A). C. A. Favrot, with discussion. 27 pp. La Eng Soc, Pro—June, 1918. Points in the planning of cities.

Yorkship Village (87210 B). Charles C. May. Ills. 2000 w. Arch For—June, 1918. A housing development near Camden, N. J., for the N. Y. Ship-building Corporation.

City Planning as an Engineering Problem (86682 A). Nelson P. Lewis. 2500 w. Mun Eng—June, 1918. Critical discussion of European city planning; elements of a proper plan; the engineer's responsibility and opportunity.

Designs

Economic Considerations in Municipal Engineering Designs (85556). Clinton S. Burns. 2500 w. Eng & Con—April 10, 1918. Estimates based on normal prices, and points in planning an economic system.

Disinfecting

Combating Disease Organisms in Quarantine Stations and in Hospitals (83371 N). Henry A. Dixon. Ills. 2500 w. Comwh Engr—Nov. 1, 1917. Details of steam disinfecting apparatus.

Dutch East Indies

Een Algemeen nitbreidings en verbeterings plan voor de gemeente Sema-

MUNICIPAL

rang (87111 B). H. MacLaine Pont. Ills. 5800 w. Ingenieur—May 4, 1918. Improvement plans for Semarang, Java.

Garbage

Wichita Shares Profits From Feeding Garbage to Hogs (87015). 2500 w. Eng News-Rec—June 20, 1918. Contractor collects and disposes of garbage paying city 10 per cent. net income.

Utilization of City Garbage for Fuel Briquettes and Other Products (83345). William H. Phillips. 1200 w. Mfrs Rec—Jan. 3, 1918. Plans for the economic disposal of garbage.

Garbage Collection and Disposal Under War Conditions (89584 A). M. N. Baker. 6 pp. Eng News-Rec—Oct. 17, 1918. U. S. Food Administration makes country-wide survey. Data summarized and discussed.

Baltimore Receives Bids for Garbage Disposal as Part of General Plan for Improved Collection and Disposal of Municipal Waste (87273 A). Walter E. Lee. 4000 w. Mun Eng—July, 1918. The refuse problem and methods of disposal.

Municipal Contribution to Conservation Through Garbage Utilization (87283 B). Edward D. Very. Also, American Garbage Disposal Industry and Its Chemical Relation. Raymond Wells. 7000 w. J1 Ind & Eng Chem—July, 1918. Deals with methods and results.

New York City has Largest and Best Garbage-Reduction Works (85095). Ills. 2500 w. Eng News-Rec—March 21, 1918. Details of plant with capacity of 1500 tons a day.

Recommended Garbage and Rubbish Disposal Methods for Baltimore, Md. (84932). 1000 w. Eng & Con—March 13, 1918. Methods recommended by Walter E. Lee.

The Effect of the War on the Production of Garbage and Methods of Disposal (82969). From paper by I. S. Osborn. 2000 w. Eng & Con—Dec. 12, 1917. Considers decrease in quantity and quality and tendency to change methods of disposal.

Imhoff Tanks

Prevention of Imhoff Tank Foaming at Schenectady, N. Y. (89398 A). Harrison P. Eddy. 1000 w. Mun Eng—Oct., 1918. Conditions and the controlling by drawing sludge or scum.

Experiences in Six Years' Operation of Imhoff Tanks (84931). 2200 w. Eng & Con—March 13, 1918. From paper by

Industrial Cities

Paul Molitor before the N. J. Sewage Works Assn.

Summary of Operating Experiences with Imhoff Tanks (84927). 1200 w. Eng & Con—March 13, 1918. From paper by George W. Fuller, before N. J. Sewage Works Assn.

Industrial Cities

The Development of an Industrial City (87304 A). Charles G. Washburn. Ills. 4500 w. A S M E, JI—July, 1918. Deals particularly with the development of Worcester, Mass.

Mosquitoes

Methods of Eradicating Mosquitoes in Malarial Control Campaign (80462). C. N. Harrub. 1800 w. Eng & Con—Oct. 9, 1918. Methods of drainage, oiling, fish control and larvacides.

Municipal Wastes

La Limpieza De Una Ciudad (87700 A). L. M. Y. Pedroso. 9900 w. Rev Soc Cubana De Ingenieros—May, 1918. City sewer systems; sewage treatment, industrial wastes, etc.

Norfolk, Va.

Handling an Extra Hundred Thousand at Norfolk (87070). Map. 1800 w. Elec Ry JI—June 22, 1918. Recent developments in this district.

Public Works

Porthcawl and Its Public Works (83,229 N). Frederick Hatcher, with discussion. Map & Ills. 24 pp. Instn Mun Cnty Engrs, JI—Nov., 1917. Drainage, water supply, sea wall improvement, etc. in Wales.

Pumping

The City of Peterborough Municipal Pumping Station (84742). H. R. Armstrong. Ills. 2500 w. Pr House—Feb., 1918. Efficient plant and excellent service.

Pumping Stations

Electrically Operating Sewage Pumping Stations of Waterloo, Ia. (88744). 2000 w. Eng & Con—Sept. 11, 1918. Abstract of a paper by G. H. Kilpatrick.

Refuse

Refuse Disposal (84473 B). Rudolph Hering, with discussion. 21 pp. West Soc Engrs, JI—Nov., 1917. Treatment, collection, methods of disposal and cost.

Refuse Collection and the Present Demand for Garbage (88010 A). Samuel A. Greeley. 1500 w. Mun Eng—Aug., 1918. Present demand for garbage. Improved collection service, and methods.

Garbage and Refuse Disposal on the Mesaba Iron Range, Minnesota (86264 A). E. J. Hawley. 2000 w. Af Eng Soc Minn, Bul—May, 1918. Types of incinerators used in three municipalities.

MUNICIPAL**Sanitation**

Recommended Methods for the Collection and Disposal of Refuse in Louisville, Ky. (82885 A). Samuel A. Greeley. Ills. 3000 w. Mun Eng—Dec., 1917. Results of field inspection. Treatment of garbage, ashes, rubbish, tins, and mixed refuse.

Contract Plans and Specifications for Obtaining Refuse Incineration Works on the Most Economical Basis (82248 A). Rudolph Hering. 3000 w. Mun Eng—Nov., 1917. Abstract of an address to the Am. Pub. Health Assn. The interrelation of plant design and operation and refuse collection; guarantees, etc.

Electricity Promotes Economy in Street Refuse Disposal (82339). Ills. 1200 w. Elec Rev, Chi—Nov. 10, 1917. New York City's modern equipment.

The Utilization of Waste Food in Town's Refuse (82511 A). John J. Beckett. 2200 w. Surv'r—Nov. 2, 1917. Explanation of Liverpool methods.

Refuse Destructor

Capacity of Toronto Refuse Destructor Exceeds Contract Provision (84115). I. S. Osborn. Ills. 3000 w. Eng News-Rec—Feb. 7, 1918. Completion and test of the Don Roadway refuse destructor at Toronto, Ont.

Operation of High Temperature Incinerator Plant at Savannah for Three Years and Nine Months (84121 A). E. R. Conant. Ills. 1200 w. Mun Eng—Feb., 1918. Details of successful plant and its operation.

Roofs

Possible Uses of the Flat Roof (82175 B). Raymond M. Robinson. 3500 w. Archt Forum—Oct., 1917. Suggestions and uses already applied.

Sanitation

Economy and Efficiency (82510 A). W. H. Eccles. 1500 w. Surv'r—Nov. 2, 1917. Discusses the prevention of disease; danger from accumulation of decaying organic matter; utilization of waste, etc.

Some Experimental Apparatus for Sanitary Engineers (86143 A). Charles L. Walker. Ills. 1200 w. Corn C E—March, 1918. Apparatus for determining the number of bacteria in air, and for measuring small amounts of gas used as a disinfectant.

The Sanitary Control of Swimming Pools (87577 B). Stephen De M. Gage, with discussion and bibliography. Ills. 77 pp. Bos Soc C E, JI—June, 1918. Aspects of the swimming pool sanitation problem.

Sewage**MUNICIPAL****Sewage Disposal**

Malaria - Control Engineering in Texas Increases Labor Efficiency (83777). Charles Scoville and H. W. Van Hovenberg. Ills. 2200 w. Eng News-Rec—Jan. 24, 1918. Mosquito-prevention work along a large railroad. Sanitary Work in the Army (83691 A). Arthur J. Martin. 7000 w. Surv'r—Dec. 21, 1917. Serial, 1st part. Public lecture in London. Details.

Sewage

Some Characteristic Design Features of the Northeast Sewage Treatment Works at Philadelphia (84735 A). W. L. Stevenson. Ills. 900 w. Mun Eng—March, 1918. Imhoff tank installation designed to care for the sewage of 300,000 people.

Methods and Costs of Pressing Sewage Sludge (84266). Kenneth Allen. Extract from paper before Am. Soc of Munic. Imp. 4000 w. Eng & Con—Feb. 13, 1918. Types of presses; sludge case; cost and general considerations.

Recovery of Grease and Fertilizers from Sewage Comes to the Front (84246). 3500 w. Eng News-Rec—Feb. 14, 1918. Massachusetts Joint Investigating Board reports against applying Miles acid process at Boston.

The Electro-Chemical Sewage Treating Process as Operated at Decatur, Ill., in 1916 (84124 A). W. S. Shields. Ills. 4000 w. Mun Eng—Feb., 1918. The electrolytic lime process and its advantages for municipal work.

Copper in Sewage at the New Haven Sewage Experiment Station (82787 B). F. W. Mohlman. Ills. 2500 w. J I Ind & Eng Chem—Dec., 1917. Reasons for investigations; details of plant and processes, etc.

Disinfection of Sewage by Copper Salts (82424). 1500 w. Eng & Con—Nov. 14, 1917. Investigations by city of New Haven, Conn., to determine upon a method of sewage disposal.

Making Sure of Proper Operating Methods at York, Pa., Sewage Treatment Plant (82247 A). Ills. 3000 w. Mun Eng—Nov., 1917. Details of the plant and its operation.

Sewage and Its Precipitation: Further Experiments (82360 A). Reginald Brown. 3300 w. Surv'r—Oct. 26, 1917. Read before the Soc. of Engrs. 1, Tests with lime only; 2, ferric sulphate (liquid) and lime; 3, sulphate of alumina and lime.

Sewage Discharge

Forecasting Sewage Discharge at Toledo Under Dry-Weather Conditions (87217). Watson G. Harmon. 2000 w.

Eng News-Rec—June 27, 1918. A study of the probable volume to be dealt with up to the year 1960.

Sewage Disposal

First Unit of Improved Means of Sewage Disposal for Philadelphia Well Started (89253 A). W. L. Stevenson. Ills. 3500 w. Eng News-Rec—Oct. 3, 1918. Design includes intercepting sewer, ventilated grist chamber with sand-removing and washing plant, and depressed venturi meter.

Design and Operation of Sewage Treatment Plants with Special Reference to Minnesota Conditions (88742). H. A. Whittaker. 1800 w. Eng & Con—Sept. 11, 1918. From report of Minn. State Board of Health.

Sewage Disposal (88662). Edward Willcox. Abstract from presidential address to the British Assn. of Mgrs. of Sewage Disposal Works. 2500 w. Can Engr—Sept. 5, 1918. Camp sewage, fertilizers, design of plants, etc.

Sewage Treatment Policies as Influenced by War Time Conditions (88762 A). George W. Fuller. 2000 w. Mun Eng—Sept., 1918. Where investments in sanitary works will do the most good.

Design and Construction of the New Sewage Treatment Plant at Sedalia, Mo. (88012 A). Robert E. McDonnell. Ills. 1500 w. Mun Eng—Aug., 1918. Details of a combined system receiving both sanitary and storm sewage.

Design Details of Proposed Works for the Collection and Disposal of Sewage at Pottstown, Pa. (88008 A). Charles E. Collins. 2500 w. Mun Eng—Aug., 1918. Explains conditions and gives details of plant.

Sprinkling Filter System and Auxiliaries vs. the Activated Sludge Process (88011 A). T. Chalkley Hatton. 4000 w. Mun Eng—Aug., 1918. Advantages and disadvantages of the two methods.

English Practice in Sewage Treatment and Disposal (86938). G. Bertram Kershaw. From presidential address. 3000 w. Eng & Con—June 12, 1918.

The Development of Sewage Treatment (86680 A). Kenneth Allen. Ills. 4000 w. Mun Eng—June, 1918. Early and recent methods of sewage disposal. The different processes.

The Miles Acid Process for Sewage Disposal (86657 A). Ills. 3500 w. Met & Chem Eng—June 1, 1918. Tests of a new chemical process.

An Unusual Automatic Pumping Station (82478). G. R. Radley. Ills. 1500

Sewage Flow

w. Elec Rev, Chi—Nov. 17, 1917. Control equipment of sewage-disposal plant at South Pasadena, Cal.

Screens, Filters and Humus Tanks for Indianapolis (82587). 2500 w. Eng News-Rec—Nov. 22, 1917. Imhoff and sprinkling filters, and activated sludge process eliminated.

Sewage Disposal Problems of a Coast Summer Resort (82625 B). William Eustis Brown. 2500 w. Am JI Pub Hh—Nov., 1917. Sanitary progress and problems.

Considerations Leading to Recommendations for Fine Screens, Sprinkling Filters, Humus Tanks, and Sludge Recovery as Sewage Disposal Method for Indianapolis (85557). From paper by George W. Fuller to Indiana Sanitary and Water Supply Assn. 4000 w. Eng & Con—April 10, 1918.

Sewage Flow

Estimating Sewage Flow Based on Floor Area of Buildings (86939). Walter S. M'Grane. 1800 w. Eng & Con—June 12, 1918. From paper before Munic. Engrs. of the City of New York. Forecasting water consumption and sewage flow in commercial buildings.

Sewage Treatment

Miles Acid Process May Require Aeration of Effluent (87960 A). F. W. Mohlman. Ills. 1200 w. Eng News-Rec—Aug. 1, 1918. New Haven experiments show that sulphur dioxide in effluent deoxygenates several volumes of diluted water.

Specific Suggestions on the Designs of Imhoff Sewage Settling Tanks (85508 A). Charles F. Mebus. Ills. 2000 w. Mun Eng—April, 1918. Importance of studying each installation. Details discussed.

Suggestions on the Design and Operation of Sewage Treatment Plants (85553). From J. H. Dunlap's paper before Iowa Eng. Soc. 2500 w. Eng & Con—April 10, 1918. Suggestions to meet Iowa conditions.

The New Sewage Treatment Plant at Xenia, Ohio (85509 A). W. J. Sherman. Ills. 700 w. Mun Eng—April, 1918. First plant a failure; design of new plant.

Small Town Sewage-Works Operation Problems Analyzed (85740). J. H. Dunlap. 2500 w. Eng News-Rec—April 18, 1918. Results of inspecting plants in 39 cities in Iowa.

Sewage Treatment

Recent Improvements to Sewage Treatment Plant at Alliance, Ohio (86,119 A). R. Winthrop Pratt. Ills. 2000 w. Mun Eng—May, 1918. History of sewage treatment at Alliance, recent improvements and details of plan.

MUNICIPAL**Sewers**

Some Points Worth Considering in the Design of Sewage Treatment Works (86121 A). John H. Gregory. 1800 w. Mun Eng—May, 1918. General arrangement and accessibility, grit chambers, screens, open channels, tool house and other details.

Sewerage

Water Supply and Sewerage of Recreation Camps at Lake Geneva, Wisconsin (86117 A). W. S. Shields. Ills. 1200 w. Mun Eng—May, 1918. Sanitary requirements.

Features of Proposed Sewerage Works for St. Augustine, Fla. (87269 A). 1500 w. Mun Eng—July, 1918. Types of construction and design recommended.

Construction Plant and Methods Employed on Recent Important Sewerage Work in Illinois (84727 A). Ills. 2000 w. Mun Eng—March, 1918. Data from report of sub-committee of Ills. Soc. of Engrs. on important work during 1917.

Distinctive Characteristics of Institutional Sewerage (85915). Henry W. Taylor. 2200 w. Eng News-Rec—April 25, 1918. Data on quantity and quality and the effect on design of sewers and treatment of sewage.

Sewer Cleaning

Motor Equipment Reduces Cost of Cleaning Sewer Catchbasins from \$3.76 to 69 Cents (88260 A). Ills. 2200 w. Com Vhlc—Aug. 15, 1918. Otterson eductor mounted on Kelly-Springfield truck.

Sewer Pipe

Report of Committee C-4 on Clay and Cement Sewer Pipe (86987 N). 6 pp. Am Soc Test Mat—June, 1918. Recommendations.

Sealing Sewer Pipes with S P C Pipe Seal Compound (85603 A). S. N. Williams. 900 w. Com C E—Feb., 1918. Use of pipe seal compound for sealing joints of pipe in wet trenches.

Sewers

Estimating Contractors' Overhead Costs in Sanitary Sewer Construction (85555). Stanley D. Moore. Address to Iowa Eng Soc. 2000 w. Eng & Con—April 10, 1918. Analysis of overhead charges, etc.

Present Tendencies in Sewer Construction and Design (85507 A). H. K. Barrows. Ills. 1500 w. Mun Eng—April, 1918. Effect of war conditions; labor-saving machinery; construction, etc.

Are Sewers Remunerative to Small Municipalities? (87249). Fred Alfred Dallyn. 2200 w. Can Engr—June 27, 1918. Analysis of costs and benefits.

Methods and Cost of Concrete and Brick Sewer Construction in Toronto

Sewer System

(86935). From article by W. S. Harvey and R. T. G. Jack, in *The Contract Record*. Ills. 2000 w. Eng & Con—June 12, 1918. Details and costs.

Organization of Forces and Plant and Methods Employed in Construction of Sewers in Chicago (86676 A). Herbert E. Hudson. Ills. 4000 w. Mun Eng—June, 1918. Interesting features in efficiency, and field organization.

Considerations Affecting the Choice Between the Separate and Combined Sewer Systems (84728 A). Paul E. Green. 1000 w. Mun Eng—March, 1918. Conditions governing selection of type.

Les Rivières De Paris (85115 B). P. Chevotot. Ills. 1600 w. La Nature—Feb. 2, 1918. General layout and interconnection of sewers in Paris.

Method and Cost of Making Light Joints in Pipe Sewers (86118 A). W. W. Dixon. Ills. 1000 w. Mun Eng—May, 1918. The value of G-K compound in stopping infiltration.

Efficiency of Storm-Water Sewers Depends on Inlets (83534). Irving P. Kane. 1000 w. Eng News-Rec—Jan. 10, 1918. Type, location, and adjacent paving should suit conditions.

Reconstruction of Queen Street Sewer, Toronto (84311). W. S. Harvey and W. G. Cameron. Ills. 4000 w. Can Engr—Feb. 14, 1918. Wooden separating troughs; details of diversion chambers; quantities and costs.

Sewer Pipe Joints (84377 B). Ills. 23 pp. Bos Soc C E, JI—Feb., 1918. Topical discussion.

Sewers: When to Build and How to Pay (84123 A). Louis L. Tribus. 1500 w. Mun Eng—Feb., 1918. Their need, design and construction, and methods of financing.

Some Practical Hints on the Design and Construction of Sanitary Vitrified Pipe Sewers (84122 A). Charles E. Collins. 3000 w. Mun Eng—Feb., 1918. Important parts of design and construction.

Sewer System

Compressed Air Sewage Lifting System of Cairo, Egypt (87921). Map and Ills. 1000 w. Eng & Con—July 31, 1918. Details of the layout and working of the sewer system; 63 Shone ejectors have been sunk.

ROADS AND PAVEMENTS**Accounting****Snow Removal**

Snow Cleaning and Removal in Ottawa (84312). L. McLaren Hunter. Ills. 700 w. Can Engr—Feb. 14, 1918. Methods used in handling snow in a city subject to heavy falls.

Street Cleaning

Sanitary Street Cleaning (83459). George A. Wiseman. Ills. 2500 w. Can Engr—Jan. 3, 1918. Reviews methods, favoring flushing.

Street Openings

Method and Cost of Using Compressed Air Equipment in Making Street Openings (82882). Ills. 1000 w. Mun Eng—Dec., 1917. Results obtained by applying air-tools.

Submerged Pipe

Flexible-Joint Precast Concrete Pipe Laid Blow Water in Lake Erie (82309). Ills. 1200 w. Eng News-Rec—Nov. 8, 1917. Details of work at Lakewood, Ohio, and at Cleveland in constructing outfall sewers.

Traffic

The Space-Grabbing Automobile (87, 851). 3000 w. Elec Ry JI—July 27, 1918. Need of regulation at Washington, D. C.

Uruguay

Americans Build Sewer and Water Systems for Three Uruguayan Cities (88482 A). Albert A. Northrop. Ills. 1600 w. Eng News-Rec—Aug. 29, 1918. Work requiring five shiploads of materials, 7,000 miles from the base of supplies completed a year ahead of time.

Construction of Water and Sewerage Systems for the Cities of Salto, Paysandu and Mercedes, Republic of Uruguay, South America (88755 A). G. E. Hines. Ills. 5000 w. Mun Eng—Sept., 1918. Municipal improvements costing \$5,000,000.

War Effects

The Effect of the War on Municipal Engineering and Public Health (82361 A). H. Percy Boulnois. 3000 w. Surv'r—Oct. 26, 1917. Serial, 1st part. Bearing of municipal engineering on public health; suspended contracts; matters effected, etc.

Waste

Industrial Waste Problems with Reference to the Smaller Cities (83501 A). Langdon Pearse. 4500 w. Mun Eng—Jan., 1918. Sewage treatment, water supply, pollution, etc.

ROADS AND PAVEMENTS**Accounting**

Uniform Methods of Road Construction Accounting Desirable (85563). Edward

N. Hines. 2500 w. Eng News-Rec—April 11, 1918. Describes variety of systems used.

Consult Classification of the Index. See page 9.

ROADS AND PAVEMENTS

Concrete

Administration

The New Kansas State Highway Administration Law (82849). W. S. Gearhart. 3000 w. Eng & Con—Dec. 5, 1917. Paper before the Oklahoma Eng. Soc. outlining the new system.

Alaska

Methods of Constructing Wagon Roads in Alaska (84784). 2000 w. Eng & Con—March 6, 1918. From annual report of the Board of Road Commissioners, describing unusual conditions.

Asphalt

Practical Hints on the Design, Construction and Repair of Asphalt Pavements (87329). Charles A. Mullen. From paper before Can. Good Roads Cong. 4000 w. Eng & Con—July 3, 1918. Materials, suggestions for mixing and laying, and maintenance.

Procedure in Maintenance of Asphalt Pavements in Buffalo (89401 A). C. E. P. Babcock, and J. A. Vandewater. 1500 w. Mun Eng—Oct., 1918. Methods, quantities, and costs.

The Asphalt Roads of Cook County, Illinois (89393 A). Walter H. Flood. 1200 w. Mun Eng—Oct., 1918. Change from macadam to concrete base; methods of construction, etc.

Methods and Cost of Constructing Kentucky Rock Asphalt Road (83429). William S. Canning. Ills. 1200 w. Eng & Con—Jan. 2, 1918.

Stone-Filled Street Asphalt Suffers from Inattention to Detail (83672). Clifford Richardson. 1200 w. Eng News-Rec—Jan. 17, 1918. Uniform composition necessary. One and a half inches on a close binder is best.

Asphaltic-Concrete

Method of Constructing Asphaltic Concrete on Dundas St., York County, Ontario (85462). From paper by R. Crawford Muir, before conference of Ontario Road Supts. Ills. 2200 w. Eng & Con—April 3, 1918.

The Saint Augustin-Quebec Road (84192). C. A. Mullen. Ills. 2000 w. Can Engr—Feb. 7, 1918. Details of construction of road of asphaltic concrete type.

Assessments

Paving and Grading Assessments on Simple Basis (86622). George H. Ruhliling. 1000 w. Eng News-Rec—May 30, 1918. Satisfactory standard method in use for four years.

Bitumens

Bitumens Used in Road Building (84908 B). Jerome S. Marcus. 1500 w. Univ Col J1 Eng—Jan., 1918. Specifications of tars for different purposes.

Bituminous

Bituminous Roads, Mixed and Penetration Methods (84228). S. R. Murray. Ills. 2300 w. Br Rds & Sts—Feb., 1918. Types of asphalt construction are considered.

Bituminous Macadam

Causes of Failure of Bituminous Macadam Pavements (86933). Walter Leavitt. 1800 w. Eng & Con—June 5, 1918. Discusses causes of failure of bituminous pavements or roads constructed by penetration methods only.

Rhode Island Practice in Construction of Bituminous Macadam (84195). I. W. Patterson. Abstract of paper before the Providence Engng. Soc. 3000 w. Eng & Con—Feb. 6, 1918. Details of construction.

Brick

De fabricage van den Straatklinker (87736 B). A. Van De Koppel. Ills. 4600 w. Ingenieur—June 8, 1918. Manufacture of paving brick in Holland. Clay employed, drying methods, kilns, etc.

Iowa County Builds Brick Road From Camp Dodge to Des Moines (85738). Ills. 1800 w. Eng News-Rec—April 18, 1918. Rapid paving for military traffic.

Tests Show Advantages of Laying Brick Directly on Concrete Base (82200). C. C. Wiley. Ills. 2500 w. Eng News-Rec—Nov. 1, 1917. Research shows that such a slab is the same as that of an equal thickness of concrete.

The Comparative Merits of Wire-Cut Lug and Repressed Brick (82649 B). Jas. C. Traville. 2000 w. Iowa Eng Soc, Pro—Feb., 1917. Their use as a paving material. Important features of wire-cut lug brick.

Construction Plant and Methods Employed in Building South Meridian Monolithic Brick Road, Indianapolis, Ind. (83497 A). Maurice B. Greenough. Ills. 600 w. Mun Eng—Jan., 1918. Use of mechanical equipment in surfacing.

British Roads

Our Roads and Their Future (86770 A). H. Percy Boulnois. Ills. 1800 w. Autocar—May 18, 1918. How the highways have fared under war conditions. Problems for road surveyors.

War's Influence on British Road Work Discussed in Report (82310). 2500 w. Eng News-Rec—Nov. 8, 1917. Heavy motor traffic has damaged highways; much reconstruction after the war.

Concrete

Initial and Maintenance Cost of Concrete Roads Prove Them Most Suitable for Truck Use (87442). Ills. 1500 w.

Consult Classification of the Index. See page 9.

Concrete

ROADS AND PAVEMENTS

Construction

Com Vhle—July 1, 1918. Need for uniform method of accounting for construction and repair.

Proper Drainage and Adequate Thickness of Bed Important Factors in Concrete Roads (87647 A). Ills. 1400 w. Com Vhle—July 15, 1918. Experience in various places. Maintenance and service.

Some Design and Construction Features of Concrete Roads (88759 A). A. N. Johnson. 2500 w. Mun Eng—Sept., 1918. Discusses width and thickness of pavement and other construction features.

Concrete Roads (86701 A). A. E. Wynn. Ills. 1800 w. Autocar—May 4, 1918. Serial, 1st part. Satisfactory results in Canada and United States after many years use.

Reinforced Concrete Highways (86799). W. B. Sawyer, Jr. Ills. 1500 w. West Eng—June, 1918. Reasons for formation of both longitudinal and transverse cracks, showing how they may be prevented.

Concrete Road Construction During Freezing Temperatures (88091). C. L. Brown. (Abstract from *Public Roads*.) 1500 w. Eng & Con—Aug. 7, 1918. Describes methods employed at Quantico, Va.

How to Get the Best Surface on a Concrete Road (88003 A). A. H. Hunter. 3000 w. Mun Eng—Aug., 1918. Construction features that must be watched.

The Concrete Roadway (88159 D). George A. Rieker. 2200 w. Okla Soc Engrs, Trans—Vol. IV, 1918. Why the author regards concrete the best development in road building.

Construction Plant and Methods Employed in Building Concrete Roads in Wayne County, Mich. (85505 A). Ills. 2000 w. Mun Eng—April, 1918. Methods employed give best results at least cost.

Concrete Roadways for Shops of the A., T. & S. F. Ry., at Topeka, Kan. (85767). Con M. Buck. Ills. 1800 w. Ry Rev—April 20, 1918. Roads for electric tractor and trailer haulage; data of hauling tests on roads of different materials.

Suitable Concrete Roads Could Carry One Million Tons of Freight Each Way Daily (85749 A). Ills. 1500 w. Com Vhle—April 15, 1918. Their construction. Saving possible through small resistance.

Concrete Highway Construction in Contra Costa County (82353). Ills. 1500 w. West Eng—Nov., 1917. Concrete without asphaltic surface.

Concrete Roads in Wood County, West Virginia (82356). Burdette Woodyard. 4000 w. Br Rds & Sts—Nov., 1917. Conditions and experience.

Building State-Aid Concrete Road Near Grand Rapids (82728). 1500 w. Eng News-Rec—Nov. 29, 1917. Methods of construction.

Concrete Roads for Trucks (84869 A). Ills. 2500 w. Com Vhle—March 1, 1918. Methods of construction.

Discussion on "Concrete Roads as a Solution of Our National Transportation Problem; Their Construction, Maintenance, and Development" (84910 A). Carl Gayler. 800 w. E Cb St L, J1—Jan.-Feb., 1918. Discussion of Mr. Fisk's paper.

Essentials of Good Practice in the Construction of Concrete Roads (84731 A). Edwin K. Borchard. 1800 w. Mun Eng—March, 1918. Details of construction.

First Frost Is Never Responsible for Cracked Concrete Roadways (84618). J. L. Harrison. Ills. 2000 w. Eng News-Rec—Feb. 28, 1918. Damage traced to freezing which follows a thaw.

A Concrete Roadway System in a Shop Yard (83540). Charles E. Parks. Ills. 2500 w. Ry Age—Jan. 10, 1918. Walks built by the Santa Fe in storehouse and shops at Topeka, Kan.

Concrete Roads as a Solution to Our National Transportation Problem; Their Construction, Maintenance and Development (83895 A). Clinton H. Fisk. 20 pp. E Cb St L, J1—Nov.-Dec., 1917. The engineering possibilities of concrete as a road material.

Design and Construction of Concrete Roads in Wood County, W. Va. (83498 A). Burdette Woodyard. Ills. 1000 w. Mun Eng—Jan., 1918. Methods, materials, etc.

Concrete Pavements

Reinforcement for Concrete Pavements (83496 A). Ills. 1500 w. Mun Eng—Jan., 1918. Methods that have proved satisfactory.

Concrete Roads

Methods and Cost of Constructing a Concrete Road in Southern California (86003). E. Earl Glass. Ills. 1200 w. Eng & Con—May 1, 1918. Replacing an oiled earth road with 3.62 miles of bituminous surfaced concrete pavement on a disintegrated granite base.

Wear Resisting Values of Various Aggregates for Concrete Roads Indicated (86043). H. S. Mattimore. Ills. 1000 w. Eng News-Rec—May 2, 1918. New machine generates impact stresses. Results of tests on paving brick.

Construction

Mechanical Material Handling System Reduces Labor and Hauling Costs and

ROADS AND PAVEMENTS

Good Roads

Eliminates Waste in Construction of Michigan Road (88628). Ills. 700 w. Eng & Con—Sept. 4, 1918. Advantages of complete mechanical system for handling.

Considerations Governing the Choice of Various Types of Road Construction (82275). 1800 w. Eng & Con—Nov. 7, 1917. Abstract of L. V. Edwards paper at meeting in State of Washington. Factors controlling the selection.

Construction Costs

Reducing Construction Costs by Increased Efficiency (83040). W. Huber. 5000 w. Br Rds & Sts—Dec., 1917. Suggestions for road construction.

Contractors

Would Rate State Highway Contractors on Past Performance (87627). S. E. Fitch. 3500 w. Eng News-Rec—July 18, 1918. Propose giving contractor part of saving proportionate to speed and efficiency shown.

Contracts

More Equitable Contracts Between Highway Commissions and Contractors (85463). Abstract of paper by James C. Travilla, before the Am. Road Bldrs. Assn. 2500 w. Eng & Con—April 3, 1918. Suggested methods.

Cost Keeping

Cost-Keeping System for County Highway Work (88341). H. A. Sewell (Abstract). 2200 w. Can Engr—Aug. 22, 1918. Elements which will apply to all cases.

County Highways

The Rational Method of Determining Types of Roads for a County Bond Issue (86425 B). William Walter Marr, with discussion. 27 pp. West Soc Engrs, Jl—Jan., 1918.

Drainage

Drainage Increasingly Vital with Growth of Heavy Traffic (89236). E. W. James. 3000 w. Eng & Con—Oct. 2, 1918. From official publication of U. S. Bureau of Public Roads.

Drainage—the Most Important Consideration Entering into Road Construction (89467). James H. MacDonald, with discussion. 6000 w. Can Engr—Oct. 10, 1918. Address at fifth annual congress of the Can. Good Roads Assn.

Road Drainage (84536). J. L. Harrison. 3500 w. Can Engr—Feb. 21, 1918. Abstract of paper read before the Indiana Road School. Particularly the drainage of subgrades.

Dust Prevention

Progress Reports of Experiments in Dust Prevention and Road Preservation, 1916 (84879). 98 pp. U S Dept Ag, No. 586—Feb. 28, 1918.

Earth Roads

Maintenance of Earth Roads (84955). John H. Mullen, at Richmond, Va. Ills. 1800 w. Br Rds & Sts—March, 1918. Organization and personal responsibility important.

Method of Building Earth Roads in Kane County, Illinois (88088). George N. Lamb. Ills. 1000 w. Eng & Con—Aug. 7, 1918. Equipment, surveys, etc.

The Necessity of Engineering Supervision in Construction and Maintenance of Earth Roads (88092). H. Ross Mackenzie. From a paper before Regina Br. of Can. Soc. C. E. 2200 w. Eng & Con—Aug. 7, 1918. Calls attention to costly errors and mistakes.

Earth Roads

Location of Earth Roads (87374). R. W. E. Loucks. 4000 w. Can Engr—July 4, 1918. The planning of roads, drainage, alignment, curves, etc.

The Necessity of Engineering Supervision in the Construction and Maintenance of Earth Roads (87250). H. Ross MacKenzie. Ills. 3500 w. Can Engr—June 27, 1918. Abstract of paper before Regina Branch of Can. Soc. of C. E. General principles and expert opinion, etc.

Excess Condemnation

A Review of the Movement for Excess Condemnation for Public Improvements (89234). 2500 w. Eng & Con—Oct. 2, 1918. Experience in the exercise of this power in Europe, and United States.

Financing

Financing Road Improvements (88528). Archibald McGillivray. 2000 w. Can Engr—Aug. 29, 1918. Explains the Manitoba policy.

France

Roads in Base Section of American Forces Require Widening and Resurfacing (88317 A). Robert K. Tomlin, Jr. Ills. 3000 w. Eng News-Rec—Aug. 22, 1918. Heavy traffic necessitates continuous maintenance.

Condition of War Zone Roads in France (84048). W. F. Bradley. 4000 w. Auto Ind—Jan. 31, 1918. French road system and its service.

Good Roads

Are Good Roads Remunerative to Municipalities? (86958). William D. Sohler. Ills. 2000 w. Can Engr—June 13, 1918. Increased taxes collected due to rise in land values.

Good Roads — a War Necessity (83575). George A. Ricker. 2500 w. Br Rds & Sts—Jan., 1918. Address at Toledo, O. Conditions making permanent roads necessary.

ROADS AND PAVEMENTS

Highway Survey

Real Motor Truck Roads and a Federal Statute Controlling Operation in Every State Are Now Necessary (83678 A). Windsor T. White. 3500 w. Com Vhle—Jan. 15, 1918. Important projects proposed.

Granite Block

Approved Practice in the Construction of Granite Block Pavements (84118 A). Clarence D. Pollock. Ills. 1500 w. Mun Eng—Feb., 1918. From paper read before the Am. Assn. for Adv. of Science.

Gravel

Two Methods of Maintaining Gravel Roads in Maine (83206). Ills. 1200 w. Eng News-Rec—Dec. 27, 1917. Describes methods. Chief reliance is placed on annual tar treatment.

Gravel Roads

Gravel Roads (86288 A). H. E. Phelps. 1800 w. Univ Col JI Eng—April, 1918. Defects of construction and maintenance are considered.

Highways

Notes on Highway Design (89235). J. L. Harrison. 2000 w. Eng & Con—Oct. 2, 1918. Considers railway crossings, aesthetic considerations, stream crossings, drainage, road material, etc.

\$20,000,000 Expenditure Proposed for Construction and Maintenance of Highways for Motor Truck Parcel Post Service (87330). 1500 w. Eng & Con—July 3, 1918. Plan outlined for the extension of motor truck postal service.

Notes on Highway Design (88629). J. L. Harrison. 2000 w. Eng & Con—Sept. 4, 1918. Points to be considered.

Planning a System of Rural Highways (88660). W. M. Stewart. 2000 w. Can Engr—Sept. 5, 1918. Classification according to traffic.

Policy and Procedure of U. S. Highways Council During the War (88756 A). 1200 w. Mun Eng—Sept., 1918. Announcement of policy effective Sept. 10, 1918.

Work of the Highway Industries Association and Necessity for Closer Cooperation Between Federal, State and County Road Authorities (88758 A). H. G. Shirley. Address at N. C. Good Roads Assn. 1800 w. Mun Eng—Sept., 1918. The aims and objects.

Highways

Great Development of Highway Transportation Demands Wider and Stronger Roads (85456 A). George C. Diehl. Ills. 1500 w. Com Vhle—April 1, 1918. Roads should not be less than 20 ft. in width.

Highway Problems Considered Under Ten Main Heads (85328). Extracts from a lecture by H. Eltinge Breed before the Roads School of Mich. Univ. 4500 w.

Eng News-Rec—March 28, 1918. Bond limitations, better drainage, lower grades.

Intense Study of Highways Forced by Circumstances (83094). 2000 w. Eng News-Rec—Dec. 20, 1917. Changes made necessary by heavier and speedier traffic. New types.

Military and Other Highways in War Time (82974). William D. Sohler. 6000 w. Eng News-Rec—Dec. 13, 1917. Address at Richmond, Va., before Am. Assn. of State Highway Officials.

Fixing the Responsibility in Highway Construction (88161 D). W. S. Gearhart. 4000 w. Okla Soc Engrs, Trans—Vol. IV, 1918. Outlines the Kansas highway system.

Limit Truck Capacity or Build Better Roads (87959 A). 2000 w. Eng News-Rec—Aug. 1, 1918. Discussion by state highway officials shows present construction inadequate for traffic.

Improper Drainage the Cause of Most Highway Failures (85092). A. A. Young. Ills. 4000 w. Eng News-Rec—March 21, 1918. Considers that no hard surface should be constructed until entire road has been under maintenance long enough to show weak spots.

Preliminary Work on Provincial Highways (85000). George Hogarth. Ills. 1800 w. Can Engr—March 14, 1918. Work on the Kingston road, Ontario.

The Construction and Maintenance of Highways Under War Conditions (83432). Arthur H. Blanchard. 2000 w. Eng & Con—Jan. 2, 1918. Factors that have retarded improvement.

Notes on Road Building in Washington's Time (83810 B). A. N. Johnson. 1500 w. West Soc Engrs, JI—Oct., 1917. Information of interest.

After the War, What? (84226). Franklin P. Wood. 2200 w. Br Rds & Sts—Feb., 1918. Suggests that surplus labor be utilized for paving the national highways, considering the resulting benefits.

The Apache Trail, Arizona (84474). T. A. Rickard. Map & Ills. 5000 w. Min & Sci Pr—Feb. 23, 1918. Beauties of the highway from Globe to Phoenix; Roosevelt dam and reclamation project, etc.

Highway Survey

Methods Employed by the Wisconsin Highway Commission in Making Condition Survey of State Trunk Highways (82274). A. R. Hirst. 1200 w. Eng & Con—Nov. 7, 1917. System devised to give required information for cooperation of the State with the Federal Government.

ROADS AND PAVEMENTS

Pavements

Intersections

Proper Radius for Turns at Intersection of Highways (88956 A). G. S. Eaton. Ills. 1000 w. Eng News-Rec—Sept. 19, 1918. Permissible banking has small effect. Problem discussed.

Macadam

Clinker Asphaltic Macadam, Houns-low (83132 A). J. G. Carey. 2500 w. Surv'r—Oct. 5, 1917. Describes resurfacing work, and gives report of inspection.

Maintenance

Procedure in the Use of Explosives on Road Maintenance Work with Specific Examples (87267 A). W. H. Dawson. 1200 w. Mun Eng—July, 1918. Work in Pennsylvania and Maryland.

Maintenance Methods for Sand-Clay and Top-Soil Roads (86934). Extracts from bulletin by R. T. Brown. 2500 w. Eng & Con—June 5, 1918. Practical suggestions.

Cost Curve of Highway Maintenance Has Well-Defined Minimum (85734). H. G. Shirley. 2000 w. Eng News-Rec—April 18, 1918. Studies indicate that expenditure depends on amount of traffic and type of tire.

Road Maintenance and Repair (84688). Alexander W. Graham. Read before Am Road Bldrs. Assn. 2500 w. Can Engr—Feb. 28, 1918. Problems encountered in Missouri.

Material

Road Material Surveys in 1915 (84-164 N). L. Reinecke. Ills. & Maps. 185 pp. Can Dept Mines—Mem. 99. Road materials available for highways.

Military Roads

Military Roads on the Island of Oahu (82528 B). William E. R. Covell. Ills. 14 pp. Prof-Mem—Nov.-Dec., 1917. Military road systems and their application to this Hawaiian island.

Military Road Conditions of the War Zone in France (85274 A). William J. Weir. 4500 w. Worc Poly Inst—March, 1918.

Military Highways (86312 B). Logan Waller Page. 13 pp. Fkn Inst, Jl—May, 1918. Requirements, design, etc.

Military Road Building Difficult Even in America (86292). Frank W. Harris. 1500 w. Eng News-Rec—May 16, 1918. Experience shows maintenance to be the principal item.

Road Builders at Work Close to Front of American Sector in France (86293). Robert K. Tomlin, Jr. Ills. 2500 w. Eng News-Rec—May 16, 1918. Maintenance, reconstruction and quarrying proceed.

Military Roads (83574). William D. Sohler. Address at Richmond, Va. 8500 w. Br Rds & Sts—Jan., 1918. Importance of stronger roads and their maintenance. Work in England, France and Italy.

Military Roads (83430). From address by William D. Sohler. 6500 w. Eng & Con—Jan. 2, 1918. Importance at the present time; roads in France; maintenance; road building in Italy, England and Wales.

Missouri Surveys

Instructions of Missouri State Highway Department for Making State Road Surveys and Plans (82850). 2200 w. Eng & Con—Dec. 5, 1917. Recently issued regulations.

Mexico

Road Work on the Punitive Expedition into Mexico (82529 B). Ernest Graves. Ills. 25 pp. Prof-Mem—Nov.-Dec., 1917. Problems encountered and methods used.

Motor Post

Reports Show Results of Motor Parcel Post Service (87504). Map. 2000 w. Eng News-Rec—July 11, 1918. 50% of the gross earnings to be used in building post roads.

Ontario

Road Development in Ontario (84689). C. R. Wheelock. Read before Assn. of Ontario Land Surveyors. 2500 w. Can Engr—Feb. 28, 1918. History of development.

Pavement Costs

Ultimate Costs of Bituminous and Water-Bound Macadam Nearly Equal in New York (87503). Dudley P. Babcock. 2500 w. Eng News-Rec—July 11, 1918. Investigations made by the New York State Highway Department.

Pavement Financing

Financing Pavement Construction and Renewals, as Illustrated by Utica and Portland (84194). George C. Warren, in *Trans. Am. Soc. of Munic. Imp.* 3500 w. Eng & Con—Feb. 6, 1918. Systems in various cities, particularly cities named.

Pavements

Present Status of Granite Block Pavements (83701). Clarence D. Pollock. 2200 w. Can Engr—Jan. 17, 1918. Abstract of paper read before Am. Assn. for Adv. of Science. The modern granite-block pavement.

Concrete Pavements (87690). Murray A. Stewart. From *Trans. Am. Soc. of Munic. Imp.* Ills. 1600 w. Can Engr—July 18, 1918. Report of experimental work to ascertain merits of different grades of concrete.

Pavements

ROADS AND PAVEMENTS

Paving

Details of Construction of Stone Block Pavements (87265 A). Arthur H. Blanchard. Ills. 2200 w. Mun Eng—July, 1918. Reviews improvements introduced during the last forty years.

Some Hints on the Construction and Maintenance of Asphalt Pavements. (87266 A). C. A. Mullen. 1500 w. Mun Eng—July, 1918.

Choosing Proper Grades for Various Types of Pavements (86115 A). William Alden Brown. 1300 w. Mun Eng—May, 1918. Adaptability of different types to various grades.

Construction Plant and Methods Employed in Building Reinforced Concrete Roads at Camp Custer, Battle Creek, Mich. (86112 A). George A. Burley. Ills. 2500 w. Mun Eng—May, 1918. Detailed description of the work.

Destruction of Wood Block Pavement Due to Use of Tar in the Creosote Oil (86113 A). P. C. Reilly. Ills. 800 w. Mun Eng—May, 1918. History of pavement laid in 1909 in Indianapolis.

Pavement Design and Construction (86111 A). George W. Tillson. Ills. 4000 w. Mun Eng—May, 1918. Development, joint filler, cushion, etc.

Some Design and Constructional Features of Modern Brick Pavements (86114 A). F. A. Churchill. Ills. 1800 w. Mun Eng—May, 1918. Monolithic and composite types are considered.

Bituminous Pavements, Adaptable to Various Conditions, With Special Reference to Type and Thickness (84738 A). L. Kirschbraun. Ills. 3500 w. Mun Eng—March, 1918. Discussion of bituminous pavements employed in high-grade construction.

Recent Developments in the Construction of Bituminous and Concrete Pavements (84782). Charles M. Upham. Abstract of paper before Am. Road Bldrs. Assn. 3500 w. Eng & Con—March 6, 1918. Summary of recent work.

Recent Practices in Construction of Tar Surfaces and Pavements (88089). Arthur H. Blanchard (abstract of address at Canadian Good Roads Cong. 3000 w. Eng & Con—Aug. 7, 1918. Outline of American and English practice.

The Action of Water on the Road Subgrade and Its Relation to Road Drainage (88004 A). J. L. Harrison. 2500 w. Mun Eng—Aug., 1918. Limitations of tile drainage, capillary attraction; freezing under pavements, etc.

Proper Method of Application of Bituminous Filler for Creosoted Wood Block Pavements and Floors (89231).

Lambert T. Ericson. Ills. 1000 w. Eng & Con—Oct. 2, 1918. Directions for the work.

The Choice of Fillers for Block Pavements (89395 A). John S. Crandell. Ills. 2500 w. Mun Eng—Oct., 1918. Types and functions of fillers, favoring bituminous fillers.

Build Permanent Pavements at New Aeronautical Station (88575 A). Samuel H. Lea. Ills. 1500 w. Eng News-Rec—Sept. 5, 1918. Roadways of concrete at Langley Field.

Present Need of Correct Interpretation of Pavement Behavior Under Constantly Increasing Traffic Requirements (88757 A). Maurice B. Greenough. Ills. 1000 w. Mun Eng—Sept., 1918. Types, etc.

Concentrated Pressure Causes Many Pavement Failures (82858). A. H. Hinkle. Ills. 1000 w. Eng News-Rec—Dec. 6, 1917. Brick surfaces particularly suffer.

The Selection of a Pavement (82893). Louis C. Rockett. 2500 w. Wis Engr—Nov., 1917. Requisites of good pavements; life, cost, traffic, etc.

A Report on the Cost of Pavements (82411 A). 1500 w. Ore Soc Engrs, J1—Oct., 1917. Deals with cost of constructing pavements in Portland, and throughout Oregon.

Hard-Surface Pavements for State Highways (82582). Charles J. Bennett. Ills. 2000 w. Eng News-Rec—Nov. 22, 1917. Systems designed for heavy motor traffic.

Considerations Affecting the Design of Pavement Foundations (85504 A). H. J. Fixmer. 1500 w. Mun Eng—April, 1918. Points to be considered in designing various types.

Paving

Engineers Advocate Hard Paving on Steep-Grade Streets (88247 A). Ills. 2000 w. Eng News-Rec—Aug. 15, 1918. Practice in using stone, brick and concrete either for full width or for strips in combination with asphalt.

Experiences in Force Account Paving in the City of St. Paul, Minn. (88005 A). Oscar Claussen. 2500 w. Mun Eng—Aug., 1918. Data, arguments and experience favorable to force account paving.

Force Account Paving at St. Paul, Minn. (89232). Oscar Claussen. From paper before Engrs' Soc of St. Paul. 2000 w. Eng & Con—Oct. 2, 1918. Preparing cost estimates, and reasons for favoring day labor plan for paving.

Some Points on Force Account Paving (87649 A). Oscar Claussen. 2500 w. Af Eng Soc Minn, Bul—July, 1918.

Paving Brick

Reasons for favoring force account paving.

Data on California Asphalt Paving Work Performed With Portable Asphalt Plant (86675 A). T. E. Stanton. Ills. 1500 w. Mun Eng—June, 1918. Data on Topeka surfacing placed on the wooden trestles on the Upper Stockton road. Work done under very trying conditions.

Street Paving at Boulder, Colorado (84905 B). H. E. Phelps. Plan. 2500 w. Univ Col J1 Eng—Jan., 1918. Details of design and construction.

Paving Brick

Rattler Tests for Paving Brick of Various Depths (84227). William C. Perkins, before Am. Assn. for Adv. of Sci. 3000 w. Br Rds & Sts—Feb., 1918. Its application to the testing of 3-inch brick.

Philippines

Traffic Density Does Not Justify Building Roads for Heavy Trucks in Philippines (86294). J. L. Harrison. Ills. 3500 w. Eng News-Rec—May 16, 1918. Philippine conditions and the most economical kind of roads.

Rattler Test

Rattler Test Called Unfair to Shallow Paving Brick (83531). William C. Perkins. 1500 w. Eng News-Rec—Jan. 10, 1918. Experience shows need of allowance to correct losses.

Reconstruction

Reconstruction of the Eaton "Model Highway" (82749). Ills. 2500 w. Can Engr—Nov. 29, 1917. Made necessary by change in traffic conditions.

Repairs

Relative Efficiency of Methods for Repairing Bituminous Macadam and Bituminous Concrete Pavements (89402 A). George H. Biles. 4000 w. Mun Eng—Oct., 1918. Condensed slightly from paper before Am. Assn. for Adv. Sci., Dec. 28, 1917.

Relative Efficiency in Methods of Repairs to Bituminous Macadam and Bituminous Concrete Pavements (83588). George H. Biles. Read before Am. Assn. for Adv. of Sci. 3000 w. Can Engr—Jan. 10, 1918. Saving methods.

Road Act

Good Progress Made in Operation of Federal-Aid Road Act (83093). 2500 w. Eng News-Rec—Dec. 20, 1917. Address of Logan Waller Page before Am. Assn. of State Highway Officials.

Road Building

Methods of Constructing Roads at Northeastern Cantonments of National Army (84781). Ills. 1800 w. Eng & Con—March 6, 1918. From paper by

ROADS AND PAVEMENTS**Road Work**

Philip P. Sharples before Am. Road Bldrs. Assn. Bituminous concrete used at three cantonments.

American Road-Building Work in French War Zone Organized (84004). Robert K. Tomlin, Jr. 2500 w. Eng News-Rec—Jan. 31, 1918. Water-bound macadam the main reliance.

Lessons Learned from Road Work in War Years Will Be Permanently Helpful (84007). H. Eltinge Breed. 2500 w. Eng News-Rec—Jan. 31, 1918. Lessons learned from experience.

Road Construction

The Use of Modern Machinery in County Road Construction (89394 A). C. B. Scott. 1800 w. Mun Eng—Oct., 1918. From address at N. C. Good Roads Assn. Brief description of various machines and devices, and new ways in which they are used.

Road Culvert

Road Culvert Checks Destructive Storm-Water Flow (89248 A). Ills. 600 w. Eng News-Rec—Oct. 3, 1918. New design prevents erosion of ditches and farm lands.

Road Materials

Typical Specifications for Non-Bituminous Road Materials (88721 N). Prevost Hubbard and Frank H. Jackson, Jr. 38 pp. U S Dept Agri, Bul 704—Aug. 30, 1918. Typical specifications used in the construction and maintenance of various types of highways.

Typical Specifications for Bituminous Road Materials (87835 N). Prevost Hubbard and Charles S. Reeve. Ills. 60 pp. U S Dept Agri, Bul 691—July 10, 1918. Revised specifications, with methods of test and directions for sampling.

The Results of Physical Tests of Road-Building Rock in 1916 and 1917 (87462 N). Prevost Hubbard and Frank H. Jackson, Jr. 29 pp. U S Dept Agri, Bul. 670—June 14, 1918. Report of Committee D-4 on Road Materials (87003 N). 12 pp. Am Soc Test Mat—June, 1918. Tentative standards and tests recommended.

Final Report of the Special Committee on Materials for Road Construction and on Standards for Their Test and Use (83272 D). 30 pp. A S C E, Pro—Dec., 1917.

Road Survey

Speedy Road Condition Survey by Auto Cost Only \$1.20 per Mile (82426). 1500 w. Eng News-Rec—Nov. 15, 1917. Wisconsin Highway Commission collects data on 7,500 miles of road.

Road Work

Road Work in Manitoba (88989). M. A. Lyons. Read before Eng. Inst. of

Sand Roads

Canada. 2200 w. Can Engr—Sept. 19, 1918. Methods of construction and maintenance.

Sand Roads

Experiment of Wisconsin Highway Commission in Improvement of Sand Roads by Hay and Tar Mats (82273). H. J. Kuelling. Ills. 1300 w. Eng & Con—Nov. 7, 1917. Construction of experimental road.

Saskatchewan

Planning a System of Rural Highways in the Province of Saskatchewan (89269). W. M. Stewart. Read before Eng. Inst. of Can. 3000 w. Can Engr—Oct. 3, 1918. Classes of roads; knowledge necessary for development, etc.

Financing Road Work in Saskatchewan (88525). H. S. Carpenter. 2000 w. Can Engr—Aug. 29, 1918. System for administering highway expenditures.

Secondary Roads

Methods and Cost of Constructing and Maintaining Secondary Roads in Southern California (85461). E. Earl Glass. Ills. 1800 w. Eng & Con—April 3, 1918. Methods for oiled earth roads.

Seepage

Impervious Bituminous Wall Suggested to Prevent Seepage Under Paving (87-956 A). 2200 w. Eng News-Rec—Aug. 1, 1918. Study made of vertical movements of pavements with reference to frost action.

Snow Removal

Snow Removal Methods and Equipment for Rochester, New York (86004). From report of the Bureau of Municipal Research. 2200 w. Eng & Con—May 1, 1918. Study by John T. Child.

Southern Roads

Comprehensive Good Roads Construction Would Enormously Benefit the South (82303). Henry Roberts. 1500 w. Mfrs' Rec—Nov. 8, 1917. Explains the needs and benefits to be expected.

Subgrades

Notes on Highway Design: Subgrades (87328). J. L. Harrison. 1400 w. Eng & Con—July 3, 1918. Wrong assumptions as to strength of subgrades; causes of pavement failures, etc.

Surfaces

Condition of Road Surface Outweighs Type of Bitumen (83533). 2200 w. Eng News-Rec—Jan. 10, 1918. Other details of secondary importance.

Recent Developments in the Design and Construction of Road Surfaces (83431). Abstract of paper by H. Eltinge Breed. 3000 w. Eng & Con—Jan. 2, 1918. Changes that will have the most influence on the development.

ROADS AND PAVEMENTS**War Roads****Surfacing**

Efficiency of the Application of Bituminous Materials for Surface Treatments on Gravel and Broken Stone Roads (84783). Julius Adler. From paper before Am. Assn. for Adv. of Sci. 2500 w. Eng & Con—March 6, 1918. On selection of materials and methods.

Tar Treatment

Tar Treatment of Streets and Bridges (86265 A). G. F. Barstow. 1800 w. Af Eng Soc Minn, Bul—May, 1918. Details of work in Stillwater, Minn.

Texas Roads

Hard Pavements Are Replacing Dusty Adobe Roads in Western Texas (82427). Ills. 2200 w. Eng News-Rec—Nov. 15, 1917. Report of El Paso County's 50-mile system.

Traffic Census

Make \$35,000 Traffic Census in Chicago Loop (84114). 1500 w. Eng News-Rec—Feb. 7, 1918. Maximum hourly record 1142 vehicles.

Traffic Count

Analysis of the Traffic Count in Downtown Chicago (86545 B). George C. D. Lenth, with discussion. Ills. 90 pp. West Soc Engrs, Jl—Feb., 1918. The traffic problem and proposed Michigan Ave. improvement.

Transportation Problems

Improved Highways and Waterways as War Necessities, as Viewed by General Goethals and Major-General Black, Chief of Engineers, United States Army (83119). 3500 w. Mfrs' Rec—Dec. 20, 1917. Statements of two eminent engineers.

Truck Roads

Few Grades Over 5% on New Jersey Truck Roads (88549 A). Map & Ills. 800 w. Com Vhle—Sept. 1, 1918. New Jersey plans 655 miles of real truck roads with 20-ton bridges.

Vibration

L'Habitation Et Les Trépidations De La Chaussée (87126 B). M. Bousquet. Ills. 2000 w. La Nature—May 11, 1918. Vibrations of pavements and buildings caused by heavy vehicles.

War Lessons

Lessons of the War as Applied to Roads and Bridges (87057). Walton Maughan. (Abstract.) 1500 w. Can Engr—June 20, 1918. Calls attention to new points brought out by the war.

War Roads

Pennsylvania War Road Example (85187). R. H. Johnston. Ills. 1500 w. Auto Ind—March 21, 1918. Snow removal reduces annual maintenance.

WATER SUPPLY

Cantonments

Wet Subgrades

Subsurface Water and Its Relation to Pavement Troubles (84780). J. L. Harrison. 3000 w. Eng & Con—March 6, 1918. Outlines the problem.

Women Workers

Employment of Women on State Highway Construction (89233). Herbert A. Nunn. 700 w. Eng & Con—Oct. 2, 1918. Experience favorable on Oregon State Highways.

Wood Block

Wood-Block Pavement Failures of Southern Cities Analyzed (84244). Ills.

2000 w. Eng News-Rec—Feb. 14, 1918. Bituminous filler found to give good results.

Causes of Expansion Trouble in Wood Block Pavements in Texas Cities (84779). Ills. 1200 w. Eng & Con—March 6, 1918. Information from C. H. Teesdale's paper.

Creosoted Block Can Be Laid on Hardened Pitch Cheaper Than on Dry Mortar (83096). Walter Buehler. Ills. 2000 w. Eng News-Rec—Dec. 20, 1917. Details of construction.

WATER SUPPLY

Analysis

A Sanitary Interpretation of Water Analysis (82166 B). E. C. Richardson. 2800 w. Cleve Eng Soc, J1—Sept., 1917. Bacteriological and chemical analysis and the maintenance of wholesome water supply.

Aqueducts

Station Work Solves Labor Problem in Constructing Concrete Aqueduct of Winnipeg Water Supply (89461). F. P. Kemon. Ills. 2500 w. Eng & Con—Oct. 9, 1918. Details of the station work system and reasons for its adoption.

Artesian Supply

History of the Artesian Supply at Savannah, Georgia (88924 N). E. R. Conant. 10 pp. Am W-Wks Assn, J1—Sept., 1918. History, geological data, etc.

Artesian Wells

Artesian Wells for Water Supply, with Special Reference to the Artesian Wells of Wisconsin (89397 A). W. G. Kirchoffer. 2500 w. Mun Eng—Oct., 1918. Early history; the essential condition, sources, velocity of flow, etc.

Atmospheric Pollution

Atmospheric Pollution and the Impurities of Rain-Water (83072 A). John B. C. Kershaw. 2500 w. Engr—Nov. 23, 1917. Results of two years' observations in twelve English towns and cities.

Australia

Railway Water-Supplies in Western Australia: Difficulties Caused by Salt in Soil (87474 N). Robert Bleazby. 7 pp. Instn C E, Pro—Paper No. 4193. Explains the difficulties and methods adopted in dealing with them.

Bacterial Removal

A Preliminary Analysis of the Degree and Nature of Bacterial Removal in Filtration Plants (88926 N). Abel Wolman. 2000 w. Am W-Wks Assn, J1—Sept.,

1918. Certain basic characteristics of rapid sand filtration.

British Columbia

Water Resources of British Columbia (86768). William Young. Abstract of address before the B. C. Mfrs. Assn. 1200 w. Can Engr—June 6, 1918. The value of this resource in irrigation and water power.

Camp Devens

The Building of Camp Devens (87581 D). Leonard Metcalf and George W. Fuller. 8 pp. N E W-Wks Assn, J1—June, 1918. Discussions of work.

California

Construction of Collection and Transmission System for Marin Municipal Water District (89024 A). Ills. & Map. 3500 w. West Eng—Sept., 1918. Detailed description of this work just north of San Francisco.

Camps

Water Supply and Sanitation at Government Camps and Shipyards (88921 N). Samuel A. Greeley. 1000 w. Am W-Wks Assn, J1—Sept., 1918. The objects of the work and methods explained.

Camp Supply

Details of the Design and Construction of the Water Supply of Camp Meade, Md., 70th National Army Division (84117 A). Morris Knowles. Ills. 1200 w. Mun Eng—Feb., 1918. Construction details and methods.

Cantonments

Sanitary Aspect of the Water Supplies at the Army Cantonments (88922 N). James T. B. Bowles. 1200 w. Am W-Wks Assn, J1—Sept., 1918. The development of supplies.

Construction Features of Water Supply System and Sewerage Works for the Camp Custer Cantonment (82968). Ills. 3500 w. Eng & Con—Dec. 12, 1917. Details of this work at a camp in Michigan.

Catskill**WATER SUPPLY****Dams**

Solving the Water Supply and Sewerage Problems at the Camp Pike Cantonment (82243 A). E. B. Black. Ills. 1000 w. Mun Eng—Nov., 1917. Near Little Rock, Ark.

Water Supply Specifications for National Army Cantonments Reviewed (83454). Dabney H. Maury. 2500 w. Eng News-Rec—Jan. 3, 1918. Attention given to quality, quantity and pressure.

Catskill

The Catskill Water Supply System (87587 N). J. Waldo Smith. 9 pp. Am W-Wks Assn, J1—June, 1918. Outlines this great project and its successful completion.

Catskill Supply

New York City's Catskill Mountain Water Supply (86500 B). Alfred D. Flinn. Ills. and Map. 37 pp. Prof Mem—May-June, 1918. Outline of the system, description of the works, etc.

Charges

The Basis of Water Charges in Urban Areas from the Point of View of Common Utility (83589). E. C. Rodda. Extracts from paper read before Munic W-Wks. Assn., at Birmingham, Eng. 2500 w. Can Engr—Jan. 10, 1918. Methods of raising revenue in certain communities.

Chicago

Sanitary Precautions Taken Prior to Opening Wilson Avenue Crib and Tunnel of Chicago Water Works (88763 A). John Dill Robertson and Herman N. Bundeson. Ills. 1000 w. Mun Eng—Sept., 1918. Design and construction features of works.

Why Chicago Should Meter Its Water (84267). 3000 w. Eng & Con—Feb. 13 1918. Abstract from report by Chicago Bureau of Public Efficiency. Waste greater than any other city except Buffalo.

What Becomes of the Water Pumped in Chicago (84933). 3000 w. Eng & Con—March 13, 1918. From report of Chicago Bureau of Public Efficiency.

Chlorination

Results of the Chlorination of Public Water Supplies in Michigan (84736 A). Edward D. Rich. 2000 w. Mun Eng—March, 1918. Information from Eng. Bul. No. 10 of the Mich. State Bd. of Health. Conditions where successful; and also its limitations.

Cleaning Mains

The Mechanical Cleaning of Water Mains in Rochester, N. Y. (83500 A). Edward H. Keith. Ills. 1500 w. Mun Eng—Jan., 1918. Details of work and advantages.

Clinton, Iowa

A Presentation of Estimates and Rates of a Proposed Water Works System for the City of Clinton, Iowa (82647 B). J. G. Thorne, with short discussion. 6500 w. Iowa Eng Soc, Pro—Feb., 1917. Plans and cost for four alternate systems, with annual cost and rates required.

Making and Placing Ten Miles of Concrete Pipe for Winnipeg Aqueduct (83673). K. B. Kumpe. Ills. 1800 w. Eng News-Rec—Jan. 17, 1918. Rapid casting of pipe $5\frac{1}{2}$ feet in diameter and 8 feet long for pressure end of a pipe line.

Conduits

Formulas for Calculating Thickness and Reinforcement for Concrete Conduit (86936). L. Robert de la Mahotiere, in *Le Genie Civil*. 1000 w. Eng & Con—June 12, 1918. Calculations applied in connection with the new water system for Bangkok.

Consumption

Report of the Joint Committee on Water Consumption (82437 D). 1000 w. N E Wk Assn, J1—Sept., 1917. On standard form for statistics.

Measures Adopted to Curtail Water Consumption in the City of St. Louis (84733 A). Edward E. Wall. 1600 w. Mun Eng—March, 1918. Meterage the only way to lower consumption.

Dam Failure

Failure of Part of the Calaveras Dam (86237 A). Ills. 1500 w. West Eng—May, 1918. Earth dam in California, 250 ft. high.

Dams

A New Method of Designing Masonry Dams (87471 N). Arthur Askwith Stoddard. 12 pp. Instn C E, Pro—Paper No. 4205. Results of recent investigations and their application to practical design.

Operation of Grand River Roller Dam Proves Satisfactory (87214). S. O. Harper. Ills. 1500 w. Eng News-Rec—June 27, 1918. Observations on behavior of largest of the three dams of its type in the country.

Reservoir Dams (87546 A). Ills. & Plates. 2500 w. Eng—June 21, 1918. Examples of difficult dam construction. Suggestions.

Construction Methods Used on the Junction Dam (88782 A). Ills. 1500 w. Eng News-Rec—Sept. 12, 1918. Excavating, concreting, and winter earth sluicing.

Improving Arch Action in Arch Dams (87738 D). 700 w. A S C E, Pro—Aug., 1918. Discussion of L. R. Jorgensen's paper.

Dams

WATER SUPPLY

Dams

Sixty-One-Foot Hydraulic-Fill Dam Rests on Earth Foundation (88781 A). William G. Fargo. Ills. 2200 w. Eng News-Rec—Sept. 12, 1918. Notable features of junction development in Southern Michigan.

Accident and Reconstruction of a Clay Puddled Dam (86604). A. Dumas, in *Le Genie Civil*. Ills. 1200 w. Eng & Con—May 29, 1918. Features of the Charmes dam, the accident, and method of repairing.

Dam Sites on the Missouri (86903 A). Doane Robinson. Maps & Ills. 2000 w. Pahasapa Qr—June, 1918. Abstract of an address at Dakota School of Mines. Projects for developing power.

New Type of Arch Dam (86700 N). Ills. 1200 w. Comwh Engr—April, 1918. Brief explanation of the principle, with short description of the Salmon Creek dam, Juneau, Alaska.

The San Pablo Dam (86797). Ills. 2000 w. West Eng—June, 1918. Hydraulic-fill dam now under construction near Richmond, Calif. The storage capacity will be 14,000,000,000 gals.

Construction of Concrete Dam in Hudson River at Troy, N. Y., 1916 (87836 B). A. C. Harper, and others. Ills. 18 pp. Prof Mem—July-Aug., 1918. Details of the work with reports.

Facing Leaky Rock Fill Dam with Timber Planks (87957 A). George M. Bull. Ills. 2200 w. Eng News-Rec—Aug. 1, 1918. Three rows of creosoted boards were placed on face.

Repair Washout Under Dam by Sheet Pile Cutoff Embedded in Concrete (87-812 A). Ills. 3000 w. Eng News-Rec—July 25, 1918. Cause of accident and methods of repair.

Earth Dam Has Screened Gravel Core and Pipe Drains (84393). L. V. Branch. Ills. 1500 w. Eng News-Rec—Feb. 21, 1918. Irrigation dam in Montana.

Will Cost Half Million to Make Austin Dam Usable (84390). 700 w. Eng News-Rec—Feb. 21, 1918. D. W. Mead advises city that the partly rebuilt dam is still defective.

The Construction of Nepaug Dam (84-404 D). H. W. Griswold. 1600 w. N E Wr Wks Assn, Jl—Dec., 1917. Construction of a masonry dam and appurtenances.

The Design of the Diversion Conduit and Waste Works of the Richards Corner Dam at New Hartford, Conn. (84403 D). R. E. Wise, with short discussion. 2500 w. N E Wr Wks Assn, Jl—Dec., 1917. Design of the stream control conduit, the spillway, and waste channel.

Demolition of the Ragged Rapids Dam (83698). Sidney Bowen. Ills. 1600 w. Can Engr—Jan. 17, 1918. Reinforced concrete dam dynamited under full head of water.

Floating-Crest Gates Used on Sherburne Lakes Dam (83676). Ills. 1200 w. Eng News-Rec—Jan. 17, 1918. Automatic movable crest, with radial top plate and cylindrical down-stream plate, devised for isolated site.

Construction Methods Used in Building the Lower Reservoir Dam of the Balmorhea Project (85922 D). Vernon L. Sullivan. Ills. 800 w. A S C E, Pro—April, 1918. Economical and practical methods of constructing earth dams.

Improving Arch Action in Arch Dams (86548 D). L. R. Jorgensen. Ills. 15 pp. A S C E, Pro—May, 1918. Reasons for arch shortening; crown deflections; deformations; outlining a method for pressure grouting spaces, etc.

High Multiple-Arch Concrete Dam for Salt Lake City Water-Supply (84795). Ills. 1200 w. Eng News-Rec—March 7, 1918. Cost \$100 per acre-foot of storage.

Large Taintor and Sector Gates of the Middle Falls Dam at Rochester (84902 A). Edgar R. Crofts. Ills. 3500 w. Corn C E—Jan., 1918. Novel features of a new hydro-electric development, particularly the movable dam and gates built for it.

Calaveras Hydraulic Fill Earth Dam (83158 A). G. A. Elliott. Ills. 3000 w. Univ Col Jl Eng—Oct., 1917. Design, construction, and related matters.

La Loutre Dam Across St. Maurice River Completed (83263). Charles Luscombe. Ills. 2500 w. Can Engr—Dec. 27, 1917. Transportation difficulties, construction, etc.

Construction Plant and Methods Employed in Building the Nepaug Dam of the Hartford Water Works (82245 A). H. W. Griswold. 1800 w. Mun Eng—Nov., 1917. Details of the work, with cost.

The Effect of Intensive Water on the Stability of a Masonry Dam (82373 A). A. A. Stoddard. Ills. 2500 w. Engng—Oct. 26, 1917. Examines hypotheses and theories aiming to show the possible action and its bearing on the design.

The Mountain Dell Dam (82626 A). Sylvester Q. Cannon. Ills. 1000 w. Utah Soc Engrs, Mthly Jl—Sept., 1917. Details of reservoir for storage of water for supply of Salt Lake City.

Distribution

Construction of the Phelps Brook Dam.—Water Supply for Hartford, Conn. (85671 D). J. F. Shaughnessy, with discussion. 2500 w. N E W-Wks Assn—March, 1918. Details of the work.

Method of Repairing Revetment on Belle Fourche Dam (85703). B. E. Hayden. 2000 w. Eng & Con—April 17, 1918. Details of work in South Dakota.

New Installation Keeps Ice Away from Keokuk Dam (85914). Ills. 2000 w. Eng News-Rec—April 25, 1918. Pipe line across river supplies constant current of air and prevents ice forming.

Middle Section of Upstream Side of Calaveras Dam Slips Into Reservoir (85470). Allen Hazen and Leonard Metcalf. Ills. 2200 w. Eng News-Rec—April 4, 1918. Estimated that the slide involves 800,000 to 2,800,000 yards placed.

Distribution

Some Phases of Work in the Distribution Section of the Water Division, St. Louis (88030 N). W. A. Foley. 1400 w. Am W-Wks Assn, JI—Sept., 1918. Features not usually found in other municipalities.

Improvements in Water Distribution System Under Efficient Organization (86185). R. S. Spalding. Ills. 1500 w. Eng News-Rec—May 9, 1918. Recent advances and savings in the water distribution system of Chicago.

Electrification

Electrification of Pumping Stations Saves Coal and Money (86183). Harrison R. Cady. Ills. 1000 w. Eng News-Rec—May 9, 1918. Philadelphia Water Bureau combines several small pumping, power and lighting loads at one of its smaller pumping and filtration plants.

England

Water Supply in the Midlands (86491). 1700 w. Times Engng Supp—April 26, 1918. New water works of the Derwent Valley.

Filters

Intermediate Rate Fine-Sand Water Filter Operates Under Vacuum (87216). Ills. 1200 w. Eng News-Rec—June 27, 1918. Silty water clarified at El Centro, Calif.

Filter Sand

Experience With Filter Sand at Columbus, O. (86937). 1100 w. Eng & Con—June 12, 1918. Information from last annual report of Charles P. Hoover.

Filtration

Drifting Sand Filter, Toronto Island (89661). George C. Nasmith and N. J. Howard. Ills. 2000 w. Can Engr—Oct. 24, 1918. Report as to its efficiency.

WATER SUPPLY**Filtration**

Preliminary Analysis of Degree and Nature of Bacterial Removal in Filtration Plants (89463). Abel Wolman. 1500 w. Eng & Con—Oct. 9, 1918. Abstract of paper before St. Louis Convention of Am. W-Wks. Assn.

Proposed Filter Plant for Walkerville, Ont. (89625). Ills. 1000 w. Can Engr—Oct. 17, 1918. Details of a new plant to be erected next spring.

Some Design and Construction Features of the New Slow Sand Water Filtration Plant at Auburn, New York (89399 A). J. Walter Ackerman. Ills. 1500 w. Mun Eng—Oct., 1918. Descriptive.

The Flow of Water in Wash Water Troughs for Rapid Sand Filters (89655 A). Frank V. Fields. Ills. 3000 w. Corn C E—May, 1918. Investigation to secure data on which to base the design of wash water troughs.

Filtration Plant at Aylmer, P. Q. (82206). H. Llewellyn Seymour. Ills. 3500 w. Can Engr—Nov. 1, 1917. Read before Can. Soc. of Civ. Engrs. Crushed marble mixed with silica sand as filtering medium in gravity type mechanical plant.

Mechanical Filter Bottoms and Strainer Systems (82436 D). Robert Spurr Weston. 2200 w. N E Wr Wks, JI—Sept., 1917. Describes types, and difficulties.

Rapid Sand Filtration (82435 D). George A. Johnson, with discussion. 83 pp. N E Wr Wks Assn, JI—Sept., 1917. Reviews growth of filtration in North America, giving statistics, systems, etc.

Design and Construction of New Mechanical Water Filtration Plant at Oshkosh, Wis. (87270 A). T. B. Jorgensen. Ills. 1000 w. Mun Eng—July, 1918. Details of a new purification plant.

Mechanical Filtration Plant at Lethbridge, Alberta (87372). Arthur M. Grace. Ills. 2500 w. Can Engr—July 4, 1918. New low service pumping station and relocation of intake.

Care and Operation of Mechanical Rapid Sand Filtration Plant (84406 D). John W. Gaitenby, with discussion. 1700 w. N E Wr Wks Assn, JI—Dec., 1917.

Coal Pre-Filter Prevents Sand Accretion in Final Rapid Water Filters (86182). Ills. 1200 w. Eng News-Rec—May 9, 1918. Work at Lawrence, Kan., involves increased supply from wells, complete purification plant for iron and hardness removal.

Reduction of Free Carbonic Acid in Settled Water Increases Length of

Fountains

Filter Runs at Panama (84928). 2000 w. Eng & Con—March 13, 1918. Information from report of George C. Bunker on the operation of these plants.

Water Filtration Plant at St. Hyacinthe, P. Q. (84999). Frederick Elbert Field. Ills. 2000 w. Can Engr—March 14, 1918. Four units, each of 1,000,000-gallons daily capacity.

Some Methods and Results of Filtration at Providence Water Works (85670 D). Frank L. Cady. Ills. 17 pp. N E W-Wks Assn—March, 1918. Construction and statistics.

Fountains

Progress Report of the Committee on Sanitary Drinking Fountains (87589 N). 1600 w. Am W-Wks Assn, JI—June, 1918. Fundamental principles which most fountains violate. Short bibliography.

France

American Army's Water-Works Projects in France Number About Four Hundred (88573 A). Robert K. Tomlin, Jr. Ills. 2500 w. Eng News-Rec—Sept. 5, 1918. Great range in size and character.

Water-Supply at the front in France (86179). Robert K. Tomlin, Jr. Ills. 4000 w. Eng News-Rec—May 9, 1918. Engineering work for American forces centralized in specialists.

Gardens

Features of Overhead Irrigation Systems in Small Gardens Within Reach of City Water Works Plants (84734 A). W. H. Coles. 1300 w. Mun Eng—March, 1918. Story of the development of overhead irrigation.

Grouting

Grouting of the Rock Foundations of the Dams of the Additional Water Supply of the City of Hartford (84405 D). J. E. Garratt. 3500 w. N E Wr Wks Assn, JI—Dec., 1917. The work of testing and grouting the foundations.

Hartford, Conn.

Engineering on the Additional Water Supply for the City of Hartford (84402 D). H. W. Horne, with discussion. 2000 w. N E Wr Wks Assn, JI—Dec., 1917. Details of extensive work including two reservoirs.

Hartford's Distribution System (84401 D). Frank Brainard, with discussion. 2200 w. N E Wr Wks Assn, JI—Dec., 1917. Brief account of the development and matters related.

Hartford Water Works, Past and Present (84400 D). W. E. Johnson. 1600 w. N E Wr Wks Assn, JI—Dec., 1917. Sketch of the growth and development.

WATER SUPPLY**Manchester, Eng.****Havana**

El Problema Del Agua En La Habana (85103 A). J. Primelles. Ills. 6000 w. Rev Soc Cubana De Ingenieros—Feb., 1918. Water supply for Havana. Construction work and design of reservoirs and aqueduct.

Industrial Plants

Watering and Unwatering an Industrial Plant and Its Relation to the Public Water Supply (86123 A). William F. Wilcox. 4000 w. Mun Eng—May, 1918. The problems of industrial supply, the difficulties and differences.

Joints

Metalium (87594 N). Homer V. Knouse. Ills. 2000 w. Am W-Wks Assn, JI—June, 1918. Advantages claimed for this jointing material, and results of its use.

Kutter's Formula

Algae Growths Increase Value of n in Kutter's Formula (87811 A). Paul Taylor. Ills. 1200 w. Eng News-Rec—July 25, 1918. Results of studies made in 1912-16 in Tieton irrigation canal, lined with reinforced-concrete blocks.

Laboratories

American Water Works Laboratories (82970). Abstract of paper by J. J. Hinman, Jr., before Am W-Works Assn. 2500 w. Eng & Con—Dec. 12, 1917. Summary of results of investigation.

Leakage

Leakage from Vitrified Pipe Used to Convey Water Under a Low Head (85676 N). William W. Brush. Ills. 3500 w. Am Wr Wks Assn, JI—March, 1918. Describes N. Y. city pipe line, the leaks repaired, tests of joint material and conclusions.

London

Chemical and Bacteriological Examination of the London Waters (88068). 6000 w. Can Engr—Aug. 1, 1918. From a report of the Metropolitan Water Board for year ending March 31, 1918.

Mains

Matheson Joint Steel Water Mains (85673 D). F. N. Speller. Ills. 900 w. N E W-Wks Assn—March, 1918. Reliability, durability etc.

Mains (85672 D). 11 pp. N E W-Wks Assn—March, 1918. Topical discussion.

City of Detroit Offsets Labor Shortage by Using Machinery for All Water Main Construction (88761 A). Ills. 1000 w. Mun Eng—Sept., 1918. Details of machinery replacing hand labor.

Manchester, Eng.

Water Supply of Manchester (88421). 1100 w. Times Engng Supp—July, 1918.

Manganese Removal

A new project for bringing water from the Lake District in the north of England.

Manganese Removal

Removal of Manganese from Water Supplies (82423). H. P. Corson. 3500 w. Eng & Con—Nov. 14, 1917. Abstract of thesis outlining methods developed.

Manganese

Manganese in the Water Supply of Pierre, South Dakota (82860). J. W. Sale. Ills. 1200 w. Eng News-Rec—Dec. 6, 1917. Two-inch mains badly clogged. Aeration and milk of lime treatments prove effective in laboratory tests.

Manifold

The Double 48-Inch Manifold at Bissell's Point, St. Louis (88928 N). C. M. Daily. 1800 w. Am W-Wks Assn, JI—Sept., 1918. Brief history of the St. Louis water-works showing conditions, with description of the double 48-inch manifold.

Meter Capacities

Methods of Determining and Plotting Meter Capacities and Some Results (87591 N). Fred B. Nelson. 11 pp. Am W-Wks Assn, JI—June, 1918. Methods used and results obtained in recent meter testing of the department of water supply, gas and electricity of New York.

Metering

Meters Help But Are Not Sufficient to Control Waste (86184). 1200 w. Eng News-Rec—May 9, 1918. Successful methods at Oak Park, Ill.

Setting 25,000 Meters Cut Water Consumption at San Francisco (86180). George W. Pracy. Ills. 1200 w. Eng News-Rec—May 9, 1918. Methods and costs.

Meters

Popular Objections to Water Metering and How to Overcome Them (84930). 2000 w. Eng & Con—March 13, 1918. From recent report of the Chicago Bureau of Public Efficiency.

The Results of the Use of Meters in the Metropolitan Water District, Boston (82440 D). Samuel E. Killam, with discussion. 16 pp. N E Wr Wks Assn, JI—Sept., 1917. Metered service and its success in stopping waste.

Milan

Impianto Di Sollevamento Di Acqua Potabile Della Città Di Milano (87705 B). F. Menorini. Ills. 2200 w. Industria—May 31, 1918. Pumping plant for water supply of city of Milan, Italy. Oil engines driving centrifugal pumps by belt.

WATER SUPPLY**Pipe Lines****Mineral Springs**

Mineral Springs of Canada. Part I. The Radioactivity of Some Canadian Mineral Springs (83652 N). John Satterly and R. T. Elworthy. Map & Ills. 23 Plates. 55 pp. Can Dept Mines—Bul. No. 16. Results of investigations.

New York

The Water Supply of New York (88617 A). Map & Ills. 2000 w. Engr—Aug. 9, 1918. Serial, 1st part. Condensed from paper by Alfred D. Flinn, before the Worcester Technical Club. Reviews the scheme for increasing the supply.

New York City's Catskill Mountain Water Supply (84854 A). Alfred D. Flinn. Map of Ills. 17 pp. E Cb Phil, JI—March, 1918. Before Worcester Tech. Club. Outline of the system, types of structures, reservoirs, etc.

New York City

The Regulation of Private Water Companies in New York City (84399 D). Delos F. Wilcox. 75 pp. N E Wr Wks Assn, JI—Dec., 1917. Outlines conditions and the problems due to them, and the lines along which regulation is now being undertaken.

Oklahoma City

Oklahoma City's New Water Supply (88156 D). Guy V. McClure, with discussion. May and Ills. 4400 w. Okla Soc Engrs, Trans—Vol. IV, 1918. History and description.

Organisms

Water Supplies (85669 D). William Haine, with discussion. 11 pp. N E W-Wks Assn—March, 1918. Non-technical discussion of the relation of "microscopic organisms" to water supply troubles.

Philippine Waters

The Radioactivity of Philippine Waters (83783 N). J. R. Wright and George W. Heise. Maps & Ills. 3000 w. Phil JI Sci—May, 1917. Reports investigations of typical waters.

Pipe

Prices and Depreciation of Cast Iron Pipe (87593 N). Burt B. Hodgman, with discussion. 18 pp. Am W-Wks Assn, JI—June, 1918. Tabulated data for the past fifty years, with information and results of tests.

Pipe Laying

Cost of Laying Pipe (88340). George Wehrle. 2500 w. Can Engr—Aug. 22, 1918. Information of value to waterworks engineers.

Pipe Lines

New Trunk Main Between Burrator and Roborough Reservoirs (84678 A). Ills. 700 w. Engr—Feb. 8, 1918. New pipe line for the Plymouth Corpora-

Pipes

tion Waterworks, having inside diameter of 33 in.

Air Tanks on Pipe Lines (82944 D). 9 pp. A S C E, Pro—Nov., 1917. Continued discussion of Minton M. Warren's paper.

Overland Pipe System, Ottawa Waterworks (83178). L. McLaren Hunter. Ills. 1000 w. Can Engr—Dec. 20, 1917. Details of the system and its structures.

Pipes

Experiences with Universal Cast-Iron Pipe (82439 D). John H. Walsh, with discussion. 1500 w. N E Wr Wks Assn, Jl—Sept., 1917. Favorable report.

Report of Committee on Service Pipes (82434 D). With discussion. 67 pp. N E Wr Wks Assn, Jl—Sept., 1917. Deals with materials, life, size, cleaning, etc.

Pipe Thawing

Practice in Thawing Water Service Pipes, Mains and Hydrants in North Attleboro, Mass. (85510 A). William Plattner. Ills. 1500 w. Mun Eng—April, 1918. Details of electric thawing equipment used with satisfactory results.

Pollution

The Control of Stream Pollution—A Problem in Economics (87271 A). Earle B. Phelps. 3000 w. Mun Eng—July, 1918. Favors federal control of stream pollution.

The Differentiation of Bacteria of the Colon-Aerogenes Family (85677 N). William Mansfield Clark. 3500 w. Am Wr Wks Assn, Jl—March, 1918. A study of this group in its relation to water supplies.

Potable Water

Acting on Recommendations of U. S. Public Health Service in Improving Quality of Meridian, Miss., Water Supply (85506 A). M. L. Worrell. 1500 w. Mun Eng—April, 1918. Describes conditions and gives recommendations.

Potable Water in India (85880). 2000 w. Times Engng Sup—Mar. 29, 1918. Difficulties in securing good sources; waste, spread of disease, etc.

La Sterilizzazione dell' Acqua a Scopo Potabile (83303 B). 1200 w. Monitore Tecnico—Oct. 30, 1917. Water sterilization plants now in use in Europe and South America.

Public Utilities

Procedure in Maintenance and Operation of McPherson, Kans., Water and Electric Plant (82246 A). Arthur Groesbeck. 1800 w. Mun Eng—Nov., 1917. Reorganization, operating conditions, improvements, etc.

WATER SUPPLY**Purification****Pumping Equipment**

A Log Book for an Electrically Driven Pumping Unit at New Bedford (87584 D). R. C. P. Coggeshall, with discussion. 7 pp. N E W-Wks Assn, Jl—June, 1918. Reproduction of a page of a log book for electrically operated centrifugal pumps.

Pumping Station

See same heading under MECHANICAL ENGINEERING, *Hydraulic Machinery*.

Conversion of Small Steam Operated Pumping Stations Into Electrically Operated, Automatically Controlled Stations (88009 A). John W. Toyne. 1000 w. Mun Eng—Aug., 1918. Problems due to lack of man-power and materials. Examples of successful electrification.

Mayfair Pumping Station (87018). John Ericson. Ills. 4500 w. Pwr Pt Eng—Jan. 15, 1918. Wilson Ave. system of Chicago water supply. Many features of special design.

Louisville Builds New Pumping Station on Huge Open-Well Caisson (86181). Ills. 2000 w. Eng News-Rec—May 9, 1918. First foundation of this type on the Ohio River.

Pumps

The New 110 Million Gallon Pump at the Chain of Rocks, St. Louis (88929 N). L. A. Day. 1500 w. Am W-Wks Assn, Jl—Sept., 1918. Details of a new turbine-driven centrifugal pump.

Centrifugal Pumps (87590 N). E. C. York. 2000 w. Am W-Wks Assn, Jl—June, 1918. Points of importance in selection of such pumps.

Purification

Water Supply Standards and Their Improvement (85678 N). William J. Orchard, with discussion. 14 pp. Am Wr Wks Assn, Jl—March, 1918. Standards for the protection of water supplies. Inspection, etc.

Recent Practice in the Purification and Softening of Public Water Supplies (87517 N). Fred C. Uren, with discussion. Ills. 82 pp. Instn C E Ireland, Trans—Vol. XLIII, 1918. Modern practice in water purification.

Removal of Iron, Manganese, and Carbon Dioxide from Water (87595 N). 2000 w. Am W-Wks Assn, Jl—June, 1918. Discussion of Frank A. Barbour's paper.

Plant and Animal Life in the Purification of a Polluted Stream (87597 A). C. Elsmere Turner. Ills. 12 pp. Sci M—July, 1918. A study of the biological activity in polluted streams.

Some Aspects of Chemical Treatment at St. Louis Waterworks (86959). A. V. Graf. 3000 w. Can Engr—June 13,

Quality

1918. One of a series of four papers read before the Am. W-Wks. Assn. The kind of water treated, improvement, and details of operation.

La Chloration (87121 B). Ills. 2700 w. La Nature—Apr. 27, 1918. American chlorination apparatus used for water purification for the army in France.

Some Results Secured by Chlorine Compounds in Water Purification and Sewage Treatment (86681 A). C. A. Jennings. 2500 w. Mun Eng—June, 1918. Address to S-W W-Wks. Assn. Its use and examples of successful applications.

Electrically Operated Purification Plant at Great Falls, Mont. (83032). Ills. 1200 w. Elec Rev, Chi—Dec. 15, 1917. Details of equipment and operation.

Ultra-Violet Rays Finish Treatment of Henderson Water-Supply (82729). A. T. Smith. Ills. 700 w. Eng News-Rec—Nov. 29, 1917. Sedimentation, mechanical filter, and ultra-violet purification plant.

The Ozone Method of Water Treatment and Some Examples of Recently Installed Industrial Plants (86120 A). Irwin D. Groak. Ills. 1800 w. Mun Eng—May, 1918. Processes of water purification and the ozone process.

Filter Alums Used in Ontario (85218). G. E. Gallinger. A. V. De Laporte, and F. A. Dallyn. 1500 w. Can Engr—March 21, 1918. From annual report of the Provincial Board of Health. Analyses and estimates, etc.

Combined Water Purification and Softening Plant of Great Falls, Mont. (83523). Ills. 2000 w. Eng & Con—Jan. 9, 1918. Features of plant that have given good results.

Design and Construction of the Water Purification and Softening Plant at Great Falls, Montana (83494 A). Robert E. McDonnell. Ills. 2500 w. Mun Eng—Jan., 1918. Descriptive.

Quality

The Practicability of Adopting Standards of Quality for Water Supplies (88920 N). Robert B. Morse and Abel Wolman. 30 pp. Am W-Wks Assn, JI—Sept., 1918. The difficulties in establishing a standard.

Rates

The Basis of Water Charges in Urban Areas from the Point of View of Common Utility (83057 A). E. C. Rodda. Extracts from paper before Munic. W-Wks. Assn., Birmingham. 2500 w. Surv'r—Nov. 30, 1917. Rate regulation.

WATER SUPPLY**Reservoirs**

Pennsylvania Water Rate Decision Covers Many Points (85329). Farley Gannett. 2500 w. Eng News-Rec—March 28, 1918. Supreme Court of Penn. has upheld the Public Service Commission and reversed the Supreme Court in the Ohio Valley Water Co. rate case. Points at issue.

Rate Revision in Municipal Works (85668 D). Bertram Brewer. 2500 w. N E W-Wks Assn—March, 1918. Outlines a method of treating the problem.

Reconstruction

Methods Employed in Reconstructing Fort Madison, Ia., Water Works Plant on Exact Site of Old Plant Without Interrupting Operation (86679 A). Ills. 1800 w. Mun Eng—June, 1918. Details of the work.

Records

Pumping Station Cost and Efficiency Records (82748). Mark Wolf. 2000 w. Natl Engr—Dec., 1917. System used for thirty-one pumping plants in Brooklyn.

Reservoirs

Determining the Regulating Effect of a Storage Reservoir (88577 A). Robert E. Horton. 1500 w. Eng News-Rec—Sept. 5, 1918. Differential equation for inflow, outflow, and storage relations solved by using time interval as independent variable.

Newton, Mass., Water-Works Reservoir (89408 B). Edwin H. Rogers. Ills. 1500 w. Bos Soc C E, JI—Sept., 1918. Detailed description of recently completed covered reservoir.

Some Design Features of the Waban Hill Covered Reservoir of the Newton, Mass., Water Works (86678 A). Edwin H. Rogers. 1000 w. Mun Eng—June, 1918. Design of new sections in the extension of the covered reservoir.

Great Concrete Reservoir Built with Portable Mixers (85560). E. J. Lieber. Ills. 1500 w. Eng News-Rec—April 11, 1918. Big reservoir at Highland Park, Mich.

16,000,000-Gallon Elevated Reservoir at Buenos Aires (85529 A). Ills. 1200 w. Engr—March 15, 1918. Details of two reservoirs recently put into service.

Cableway Handles Relining of Cleveland Water Basin (82584). Ills. 1500 w. Eng News-Rec—Nov. 22, 1917. Reservoir reinforced with 18,000 yards of concrete placed without erecting construction plant on roof.

Design and Construction of 1,500,000-Gallon Reinforced Concrete Reservoir (82244 A). H. F. Blomquist. Ills. 2000 w. Mun Eng—Nov., 1917. Deals with special features of design and methods of construction.

River Supply

St. Paul Concrete Reservoir Has Unique Side-Wall Design (82428). W. N. Jones. Ills. 2000 w. Eng News-Rec—Nov. 15, 1917. Hollow gravity wall section similar to that used in dam.

The Cabbage Tree Creek Reservoir for Brisbane Water Supply (84288 A). Ills. 700 w. Engr—Jan. 25, 1918. Details of dam of cyclopean concrete costing about £172,000.

River Supply

Rivers as Sources of Water Supply (84120 A). Robert Spurr Weston. 2000 w. Mun Eng—Feb., 1918. Need of purification, sterilization, etc.

Sanitation

Recent Legislation and Decisions of the Courts with Reference to the Sanitary Protection of Water Supplies (87582 D). Albert D. Sawyer, with discussion. 13 pp. N E W-Wks Assn, Jl—June, 1918. Case of the Haverhill Water Board.

Saskatchewan

The Development of Water Supplies for Rural Communities in Saskatchewan (88741). E. L. Miles. Ills. 1800 w. Eng & Con—Sept. 11, 1918. Abstract of paper before the Eng. Inst. of Canada. Development of springs, reservoirs, dams, etc.

Water Supply for Saskatchewan (88526). George Douglas Mackie. 2500 w. Can Engr—Aug. 29, 1918. Statement of conditions, explaining the difficulties.

Sault Ste. Marie

Sault Ste. Marie Water Supply Project (88064). R. O. Wynne-Roberts. Plans. 4000 w. Can Engr—July 12, 1918. Abstracts of portions of recent report. Favors gravity supply from Coldwater Creek.

Service Cocks

Loss of Head in Corporation Cocks and Service Pipes (88923 N). Bernard J. Bleistein. Ills. 1500 w. Am W-Wks Assn, Jl—Sept., 1918. A series of tests made in New York City.

Siam

Les Installations Du Service D'Eau Potable (82699 B). L. R. De La Mabotière. 4800 w. Génie Civil—Nov. 10, 1917. New water treating plant for the city of Bangkok, Siam.

Silting

Carriage of Alluvium by Water Courses (86602). Felix Drouhet, in *Le Genie Civil*. 4000 w. Eng & Con—May 29, 1918. Method of preventing the silting up of storage reservoirs.

Small Towns

Water Supplies for Small Towns (89112 A). F. R. Mahony. 1200 w. Aust Min Std—Aug. 15, 1918. Serial, 1st part. Suitable methods of providing supplies.

WATER SUPPLY

York Township Water Supply (89662). Ills. 1500 w. Can Engr—Oct. 24, 1918. Outline of scheme to supply a Canadian municipality with water.

Small Works

Some Operating Problems of a Small Water Department (84408 D). Homer R. Turner, with discussion. 2500 w. N E W-Wks Assn, Jl—Dec., 1917. Based on experience at Windsor, Conn.

Stave Pipe

The Possibilities of Creosoted Douglas Fir Wood Stave Pipe for Use in Irrigation and Water Supply Systems (86909 A). O. P. M. Goss. Ills. 1000 w. Wood Presg—April-June, 1918. Serial, 1st part. Results of tests.

Sterilization

The Sterilization of London Water (87-889 A). Also editorial. 4800 w. Engr—June 28, 1918. Reviews the last annual report of Sir A. C. Houston dealing with results of chemical and bacteriological examination of London waters.

Chlorination and Chloramine (85679 N). Joseph Race. 20 pp. Am W-Wks Assn, Jl—March, 1918. Continuation of an earlier study, attempting to place water chlorination on a scientific basis.

Storage

Advantages of the Storage of Water (88342). Melville C. Whipple. 2500 w. Can Engr—Aug. 22, 1918. Abstract of paper read before School of Public Health, Boston. Advantages, disadvantages and dangers.

Stream Pollution

Some Aspects of Stream Pollution in Connecticut (84407 D). J. Frederick Jackson. 1800 w. N E W-Wks Assn, Jl—Dec., 1917. Sources of pollution and general principles for the prevention.

Supply

Water Supply and Water Power (82746). R. W. Lewis. 2000 w. Natl Engr—Dec., 1917. Estimates and elements determining supply.

Supply Lines

Special Features of Improvements to Main Water Supply Lines of Bayonne, N. J. (87268 A). Nicholas S. Hill, Jr. Ills. 1500 w. Mun Eng—July, 1918. Outline of work of construction and repairs.

Tanks

40,000 Gal. Reinforced Concrete Tower and Tank Built for \$3,100 (88743). Ills. 1400 w. Eng & Con—Sept. 11, 1918. From paper by H. G. Overholt. Describes structure for New Trier, Minn.

Tanks for Water Supply (87260). Charles L. Hubbard. Ills. 4500 w. Natl Engr—July, 1918. Data regarding

Thawing

tanks and auxiliary equipment and methods of supporting tanks, etc.

The Range of Results Obtainable in the Use of Concrete in Water Tank Construction (84729 A). C. C. Whitaker. Ills. 2500 w. Mun Eng—March, 1918. Applications of reinforced concrete to artistic architectural effect.

Thawing

Thawing Out Frozen Services (87580 D). D. A. Hefferman, with discussion. 11 pp. N E W-Wks Assn, JI—June, 1918. Experience with electric thawing apparatus. Winter of 1917-18.

Trenching Machine

Some Experiences With a Trenching Machine (82438 D). George W. Batchelder. 1200 w. N E W-Wks, JI—Sept., 1917. Reports work of an Austin machine in Worcester, Mass.

Tunnel Lining

Design and Construction Methods for Copper Lining for City Tunnel of New York Catskill Aqueduct (82971). 4000 w. Eng & Con—Dec. 12, 1917. Information from last annual report of N. Y. City Board of Water Supply.

Waltham Water Works

How a Deficite of \$2000 was Changed to a Surplus of \$27000 in One Year at the Waltham Water Works (84732 A). Bertram Brewer. Ills. 2000 w. Mun Eng—March, 1918. Brought about by introduction of business like methods.

War Burdens

Report of Committee on War Burdens of Water Works in the United States (88931 N). 40 pp. Am W-Wks Assn, JI—Sept., 1918. Information concerning the effect on construction, operation and maintenance of water works.

Waste

Water Waste (86270 A). Edward E. Wall. 5500 w. E Cb St L, JI—March-April, 1918. Deals particularly with conditions in St. Louis.

Water Waste Elimination. Methods and Results at Oak Park, Ill. (88925 N). H. P. T. Matte. 2200 w. Am W-Wks Assn, JI—Sept., 1918. Measures necessary to supplement complete meterage.

Water

Report of Committee XIII—On Water Service (84478 N). 30 pp. A R E A, Bul—Dec., 1917.

Water Hammer

Pulsations in Pipe Lines, as Shown by Some Recent Tests (83274 D). 10 pp. A S C E, Pro—Dec., 1917. Discussion of H. C. Vensano's paper.

Water Softening

Improvements in Water Softening Practice on the Chicago & Eastern Illinois R.

R. (84052). William Henry Hobbs. 2200 w. Ry Rev—Feb. 2, 1918. Success attained with only ordinary chemicals.

Water Treatment

Recent Development in Equipment Used in Ozone Method of Water Treatment (88764 A). Irwin D. Groak. Ills. 1000 w. Mun Eng—Sept., 1918. Three new ozone machines and their applications.

Some Aspects of Chemical Treatment at St. Louis Water Works (88927 N). A. V. Graf. 3000 w. Am W-Wks Assn, JI—Sept., 1918. Explains conditions of the supply and gives details of treatment.

Water Treatment

Water Softening to Correct Boiler Corrosion (88030). William Henry Hobbs. 3500 w. Ry Rev—Aug. 3, 1918. Considers water treatment to prevent incrustation, corrosion, etc.

Fully Metered Plant Treats Highly Turbid Arkansas for Tulsa (87955 A). Ills. 2500 w. Eng News-Rec—Aug. 1, 1918. Features of the plant for treating Arkansas River water.

Water Waste

Economy in the Use of Water (88673 A). 2000 w. Ry & Loc Eng—Sept., 1918. The waste on railroads and methods of handling supplies, etc.

Methods of Water Waste Elimination in a 100 Per Cent Metered City (89460). H. P. T. Matte. 2000 w. Eng & Con—Oct. 9, 1918. Abstract of paper before Ill. Sec. of Am. W-Wks. Assn. Experience at Oak Park, Ill.

Water-Waste Report Written to Educate Lay Public (84116). 2500 w. Eng News-Rec—Feb. 7, 1918. Problems discussed in recent-report on "The Water-Works System of the City of Chicago."

Water Works

Construction Methods Employed in Building the New Intake and Remodeled Reservoirs of the Oshkosh, Wisconsin, Water Works (88760 A). T. B. Jorgensen. Ills. 1000 w. Mun Eng—Sept., 1918. Detailed description.

Waterworks at St. Thomas, Ont. (88804). R. O. Wynne-Roberts. Ills. 1000 w. Can Engr—Sept. 12, 1918. Details of plant and outline of methods of treatment. Supply from creek and 32 artesian wells.

Galt Waterworks (87813). W. F. Sutherland. Ills. 2000 w. Pr House—July, 1918. Combined steam and hydro-electric pumping station. Spring water of exceptional purity used.

War Burdens of Water-Works of United States Increase (88245 A). 3000 w. Eng News-Rec—Aug. 15, 1918. From a report to the executive committee of

Water Works

the American Water-Works Assn., made by Leonard Metcalf, George A. Johnson and George W. Fuller.

The Water Works at Camp Grant (87588 N). Charles B. Burdick. 9 pp. Am W-Wks Assn, J1—June, 1918. Water supply for cantonment near Rockford, Ill.

Water Works

Complete Reconstruction of Water Works Plant Including Filtration System on Site of Old Plant, Without Interruption of Service (85552). Ills. 2000 w. Eng & Con—April 10, 1918. Work at Fort Madison, Ia.

Fort Madison Water-Works Rehabilitated by Citizens' Corporation (85737). R. E. McDonnell. Ills. 1500 w. Eng News-Rec—April 18, 1918. Extensive repairs without interrupting service.

Design and Construction of the New Municipal Dam and Hydro-Electric Power Plant at Fort Dodge, Iowa (86,116 A). Robert E. McDonnell. Ills. 1000 w. Mun Eng—May, 1918. Details of the project and its cost.

Practical Hints on Various Features of Water Works Design (83502 A). J. W. Ledoux. 6000 w. Mun Eng—Jan., 1918.

Breadth of View in Water Works Design (84119 A). John W. Alvord. 1500 w. Mun Eng—Feb., 1918. Value of experience; study of water system necessary, etc.

The Ystradfellte Water Works (83,230 N). D. M. Davies, with discussion. Maps & Ills. 22 pp. Instn Mun

WATERWAYS AND HARBORS**Barge Canal**

& Cnty Engrs, J1—Nov., 1917. Sources of supply, works, cost, etc.

Wells

The New Artesian Well at Stuart, Iowa (82645 B). F. A. Drasda, with short discussion. 1500 w. Iowa Eng Soc, Pro—Feb., 1917. Account of well—3021 ft. deep, the geological formation, etc.

Unsandring Two Deep Wells (82201). W. C. Hammatt. Ills. 1200 w. Eng News-Rec—Nov. 1, 1917. Expedients necessary to remedy faults in drilling.

Increasing the Well Water Supply of Montgomery, Alabama (88007 A). A. O. Beauchemin. 1500 w. Mun Eng—Aug., 1918. Describes the present well water supply, the proposed development, and results of studies made.

Grouting Wells in Rock Formation Effective and Simple (88321 A). Ills. 1300 w. Eng News-Rec—Aug. 22, 1918. General principles, advantages, examples and cost.

Special Cast Iron Lining of Two Large Bore Wells (88235). W. H. Maxwell. Ills. 2500 w. Eng & Con—Aug. 14, 1918. Work at Tunbridge Wells, England.

The Sinking and Lining of Large Bore Wells for Public Water Supplies (86197). W. H. Maxwell. Ills. 2500 w. Can Engr—May 9, 1918. Details of the work.

Winnipeg District

The Greater Winnipeg Water District (85488). C. S. C. Landon. Ills. 4000 w. Can Engr—April 4, 1918. Serial, 1st part. Recommendations of a board of consulting engineers, and details of the scheme.

WATERWAYS AND HARBORS**Algeria**

Les Ports De L'Algérie Occidentale (84609 B). A. Pawlowski. Ills. 8900 w. Le Génie Civil—Jan. 26, 1918. One of the series of articles on French ports by the same author.

American Ports

How the War Has Developed American Ports (89141 A). V. G. Iden. 2500 w. Mar Rev—Oct., 1918. Reviews develop-

Australia

Harbor Development in Australia (87497 N). A. C. Mackenzie. Maps. 3500 w. Comwh Engr—May, 1918. Port development and internal lines of communication.

Baltimore

Extensive Railroad and Industrial Improvements on Baltimore Harbor (87641). Ills. 1600 w. Mfrs Rec—July 18, 1918. Important terminal improve-

ments and industrial plants recently erected along the harbor.

Bank Revetment

Concrete Paved Bank Revetment, Missouri River Improvement (85068 B). G. C. Haydon. Ills. 14 pp. Prof Mem—March-April, 1918. Details of this type of protection, and the cost.

Barge Canal

Fast Boats for the Barge Canal (87643). 600 W. Naut Gaz—July 20, 1918. Arrangements for service between New York and Buffalo.

The New York State Barge Canal (88,288 A). Ills. 2800 w. Engr—July 19, 1918. Serial, 1st part. Detailed description of the remodelling and improving of the system of canals comprised in this undertaking.

New York's New Canal Ready in 1918 (82709 A). M. E. Mutchler. Ills.

Balye

WATERWAYS AND HARBORS

Canals

& Map. 2000 w. Mar Rev—Dec., 1917. Serial, 1st part. Information concerning the Barge Canal system and the region it will serve.

The Canal as a Carrier of Coal (84704). W. W. Wotherspoon. Map. 4000 w. Cl Age—March 2, 1918. Survey of the commercial possibilities of transportation of coal consumed in New York State.

Canal Idle Under Railroad Administration (88895). Ills. 2500 w. Naut Gaz—Sept. 14, 1918. Critical discussion of the unsatisfactory conditions.

New York's New Canal Ready in 1918 (83403 A). M. E. Mutchler. Ills. 2000 w. Mar Rev—Jan., 1918. Engineering problems solved in its construction.

Blaye

Blaye, Port Francos-Italien (84607 B). A. Pawlowski. Ills. 1900 w. La Nature—Jan. 12, 1918. Improvements on water front of this town on Gironde river, western France.

Boston Terminal

Boston Army Supply Base Will Be Valuable Permanent Port Terminal (88955 A). Ills. 2500 w. Eng News-Rec—Sept. 19, 1918. Sixty acres of storage space provided.

Breakwaters

Construction of Rubble Mound Extension to Breakwater at Marquette, Mich. (84483 B). Clarence Coleman. Maps & Ills. 20 pp. Prof-Mem—Jan.-Feb., 1918. Explains conditions and describes methods.

British Guiana

Harbour Works in British Guiana (87729). 1400 w. Times Engng Supp—June, 1918. Harbor improvements projected at Georgetown.

Canadian Ports

Western Ports of Canada (89268). S. McClay. Read at Boston convention of the Am. Assn. of Port Authorities. 4500 w. Can Engr—Oct. 3, 1918. Prospects for Vancouver; Prince Rupert harbor.

Canal Lock

Construction De L'Écluse De Hausweert (85123 B). A. Bijls. Ills. 6000 w. Le Génie Civil—Feb. 2, 1918. Construction of large lock on the Zuid-Beveland Canal, Belgium.

Canal Rates

Railways, Waterways and Highways (87252). Edward A. Bradford, in the *Annalist*. Ills. 2200 w. Ry Rev—June 29, 1918. Critical discussion of rates for the N. Y. Barge Canal.

Canals

Welland Ship Canal (89627). J. Garner Flood. Ills. 4000 w. Can Engr—

Oct. 17, 1918. Notes on Canada's \$50,000,000 waterway between lakes Erie and Ontario.

Projet De Canal Latéral A L'Allier (89706 B). Ills. 3200 w. Génie Civil—Sept. 21, 1918. History and development of project for a canal bringing traffic to the Loire river in the Allier district.

Projet De Canal De Paris A Dieppe (89708 B). Ills. 2000 w. Génie Civil—Oct. 5, 1918. Project for a canal from Paris to Dieppe, on the Channel coast.

The New Trollhätta Canal (87338 A). Ills. & Plate. 3500 w. Engng—May 31, 1918. Serial, 1st part. Outlines the history of this canal, and describes recent extensions.

The Leclaire Canal on the Mississippi River (88291 A). 800 w. Engr—July 19, 1918. Details of a canal under construction along the Iowa shore of the Mississippi River, to provide a slack-water channel through the Rock Island rapids.

New Canal of Trollhattan at Göteborg, Sweden (86607). From *Le Génie Civil*. 1800 w. Eng & Con—May 29, 1918. General features of the work.

Will the Proposed Lake Erie and Ohio River Canal If Built Be An Economic Success? (86837 B). W. G. Wilkins, with discussion. Maps. 57 pp. Engrs Soc W Penn—March, 1918. Conclusions unfavorable to the project.

Canals As Coal Carriers (85128). 2200 w. Nautical Gaz—Jan. 17, 1918. Suggestion by W. W. Wotherspoon, for relieving railway freight congestion by use of all existing canals.

Barge Canal Information (86432). 2000 w. Naut Gaz—May 25, 1918. Methods of construction employed. Locks, dams, and gates described.

Future of British Canals (86435). 2500 w. Naut Gaz—May 25, 1918. Reasons why they cannot hope to rival continental waterways.

The Canal System of New York State (86431). Ills. and Map. 3500 w. Naut Gaz—May 25, 1918. Practical information from handbook issued by Gen. W. W. Wotherspoon.

Waterways and the New York Barge Canal (86433). 5500 w. Naut Gaz—May 25, 1918. Statistics and economic principles of internal waterways in general and the N. Y. Barge Canal in particular.

Mid-Scotland Ship Canal Schemes (83075 A). Maps. 3000 w. Engr—Nov. 30, 1917. History of the project and the proposed routes.

Alimentazione Idrica di un Canale Navigabile da Savona a Torino (83301 B). Ills. 3000 w. *Monitore Tec-*

Chile

nico—Oct. 20, 1917. System of internal waterways for Italy. Profile and sections of proposed canals.

The Cape Cod Canal (82945 D). 13 pp. A S C E, Pro—Nov., 1917. Discussion of William Barclay Parsons' paper.

Het Kanaal naar Twenthe (83311 B). D. A. Van Heyst. Ills. Colored Map. 5200 w. Ingenieur—Oct. 13, 1917. Map and general plans for a new system of canals in Holland.

Compressed Air Tunnel Driven Around Lock to Check Leak in Wall (85559). S. S. Hammel. Ills. 1800 w. Eng News-Rec—April 11, 1918. Completed without interference of water level in canal. At Seneca Falls, N. Y.

The New Orleans Industrial Canal (85813 A). A. M. Lockett, with discussion. 30 pp. La Eng Soc, Pro—April, 1918. Reasons for this canal; history of the project; and expected advantages.

Chile

Development of Port Chanaral, Chile (89333 A). 1200 w. Engr—Sept. 6, 1918. Details of the scheme of development of this small but favorably situated port.

Copenhagen

Copenhagen's Free Port (83915). Julius Moritzen. Ills. 1500 w. Nautical Gazette—Jan. 3, 1918. Development of this port during last twenty-five years. Prospects for the future.

Dikes

Réparation Des Dignes Du Zuyderzée (87711 B). A. Goupil. Ills. 1900 w. Génie Civil—June 8, 1918. Repair and reconstruction work on the dikes of the Zuyderzée, Holland, after 1916 storm.

Docks

American-Built Docks in France Completed by Pacific Coast Engineers (87953 A). Robert K. Tomlin, Jr. Ills. 5500 w. Eng News-Rec—Aug. 1, 1918. Details of work of engineer requirements.

Power Plant Docks (85989). R. von Fabrice. Ills. 1500 w. Pwr Pt Eng—May 1, 1918. Protection of water front and provision for docking coal barges.

Canada

Improvements to Canadian Harbors (85129). 1300 w. Naut Gaz—Jan. 31, 1918. Report of Dominion Royal Commission on improvements on the St. Lawrence and various harbors.

Drainage

Main Drainage and Its Relation to River and Harbor Front Improvements (89267). Morris Knowles and John M. Rice. 7000 w. Can Engr—Oct. 3, 1918. Serial, 1st part. Résumé of methods

WATERWAYS AND HARBORS

Dry Docks

adopted in many cities with notes regarding design of the Essex interceptor. Extracts from paper read before Am. Soc. Munic. Imp.

Dredge

Sea-Going Hydraulic Hopper Dredge for North Pacific Bars (82313). George E. Tonney. Ills. 1300 w. Eng News-Rec—Nov. 8, 1917. Specially designed for heavy work on coast of Washington, Oregon, and California.

Large Sand Digger Has Main Screen on Deck (85326). Ills. 1500 w. Eng News-Rec—March 28, 1918. Details of Ohio River dredge and its output.

The Three 15-Cubic Yard Dipper Dredges, Gamboa, Paraiso, and Cascodas, as Supplied and Used on the Panama Canal (82943 D). 20 pp. A S C E, Pro—Nov., 1917. Continued discussion of paper by Ray W. Berdeau, Jr.

Dredging

Using Electric Power to Dredge a Relocated River Channel (89585 A). J. H. Walter. 2000 w. Eng News-Rec—Oct. 17, 1918. Suction dredge operated by 800-hp. motor.

The Economics of Ladder Dredgers and Steam Hoppers (87918). Harold Berdridge. 2000 w. Eng & Con—July 31, 1918. Methods of effecting comparisons of cost of dredging.

Recent Progress in Dredging Machinery (87467 N). William Brown, with abstract of discussion. Ills. 72 pp. Instn C E, Pro—Jan. 9, 1917. The "cutter," "drag," and "moored" types, and dipper dredges.

Dry Docks

Construction of the Pearl Harbor Drydock Completed (87809 A). Ills. 2500 w. Eng News-Rec—July 25, 1918. Novel methods used in Honolulu harbor.

New Dry Dock at Quebec (88423). 1600 w. Times Engng Supp—July, 1918. Dock 1150 feet long, almost finished. Construction methods, equipment, etc.

The Sidehaul Railway Dry Dock at West Memphis, Arkansas (88363 B). Clarke S. Smith. Ills. 6 pp. Prof Mem—July-Aug., 1917. Details of construction and equipment.

Champlain Dry Dock for Quebec Harbor (88057 N). U. Valiquet. Ills. 13 pp. Can Soc C E—April 25, 1918. States conditions and describes the new dock.

Champlain Dry Dock, Quebec (86960). Ulric Valiquet. Ills. 4500 w. Can Engr—June 13, 1918. Read before Can. Soc. of Civ. Engrs. Detailed description of its construction.

WATERWAYS AND HARBORS

French Ports

Dublin

A Note on Some Recent Improvements in the Graving Dock and Ship-repairing Facilities in the Port of Dublin (87519 N). John W. Griffith. Ills. 25 pp. Instn C E Ireland, Trans—Vol. XLIII, 1918.

Dunkirk

Les Agrandissements Du Port De Dunkerque (83909 B). A. Breton. Ills. 1300 w. La Nature—Jan. 5, 1918. Harbor improvements and fortifications made at Dunkirk since war began.

Flood Control

Detention Reservoirs with Spillway Outlets as an Agency in Flood Control (89222 D). 2500 w. A S C E, Pro—Sept., 1918. Continued discussion of H. M. Chittenden's paper.

Detention Reservoirs With Spillway Outlets as an Agency in Flood Control (88735 D). 2500 w. A S C E, Pro—Aug., 1918. Continued discussion of H. M. Chittenden's paper.

Detention Reservoirs with Spillway Outlets as an Agency in Flood Control (86550 D). Ills. 20 pp. A S C E, Pro—May, 1918. Continued discussion of H. M. Chittenden's paper.

Flood Embankment

The Effect of Flood Embankments on the River Levels in the Irrawaddy Delta (87473 N). Bernhard Martin Samuelson. (Abridged.) Map. 9 pp. Instn C E, Pro—Paper No. 4771.

France

Le Réseau Navigable De La Saone (89721 C + D). M. Jacquinot. Ills. 18,000 w. Annales des Ponts et Chaussées—May-June, 1918. Navigable portion of the Saone river, and its commercial importance.

France

Les Agrandissements Des Ports De La Basse-Loire (87122 B). A. Breton. Ills. 1000 w. La Nature—Apr. 27, 1918. Development of Nantes and Saint-Nazaire due to recent improvements in the Loire river near its mouth.

Les Agrandissements Du Port De Bordeaux (87128 B). A. Breton. Ills. 1100 w. La Nature—May 18, 1918. Enlargement of the docks and harbor.

Les Ports Français Durant La Guerre (87139 B). A. Pawlowski. Ills. 6400 w. Génie Civil—May 25, 1918. Serial, 1st part. French Ports during the war—I. Bizerte and Tunis. Natural advantages, docks and harbor facilities.

Projects for the Development of the Port of Havre (86603). From *Le Génie Civil*. Ills. 2500 w. Eng & Con—May

29, 1918. Former conditions and the new programme of improvement.

Conditions at French Ports During the War (86609). Auguste Pawlowski, in *Le Génie Civil*. 2000 w. Eng & Con—May 29, 1918. War measures described.

Continental River Ports of France and Germany (86605). M. Jacquinot, in *Le Génie Civil*. Ills. 2500 w. Eng & Con—May 29, 1918. Deals particularly with interior and exterior river ports, the transportation for manufactories, unloading and storage, etc.

Travaux D'Après-Guerre Dans Les Ports, Les Rivières Et Les Canaux (83941 B). P. Mallet. 4000 w. Le Génie Civil—Dec. 1, 1917. Serial, 1st part. Plans for work after the war on seaports, rivers and canals.

French Ports

Les Ports Français Et La Guerre (89700 B). A. Pawlowski. Ills. 3200 w. Génie Civil—Sept. 7, 1918. Port of Dakar, French West Africa. Docks and harbor facilities.

La Réorganisation De Nos Ports De Commerce (89725 C + D). P. De Roussiers. 7,000 w. Soc D'Encouragement Industrie Nationale—July-Aug., 1918. Suggestions for improving and facilitating commerce by port improvements.

Les Ports Français Et La Guerre (83939 B). A. Pawlowski. 5800 w. Le Génie Civil—Nov. 24, 1917. French ports and the war. Summary and conclusion of a series of articles on this subject published during the past year.

L'Exploitation Des Ports Maritimes (88406 E). C. Lavaud. 3600 w. Mem Soc Ingénieurs Civils De France—Jan.-Mar., 1918. Improvements undertaken at French sea ports during the war.

Les Ports Français Durant La Guerre (87708 B). A. Pawlowski. Ills. 3100 w. Génie Civil—June 1, 1918. Sousse and Sfax, ports of Tunis. Harbor facilities and improvements, commerce before and during the war, etc.

Les Ports Français Et La Guerre (85255 B). A. Pawlowski. Ills. 6800 w. Le Génie Civil—March 9, 1918. Harbors and docks of West Algerian ports described.

Considérations Sur Le Port De Paris (85127 B). M. Jacquinot. Ills. 2500 w. Le Génie Civil—Feb. 16, 1918. Project for a canal 14 miles long, to connect the Seine and Oise rivers.

Cette, Port Franco-Suisse (85119 B). A. Pawlowski. Ills. 1200 w. La Nature—Feb. 9, 1918. Harbor and dock

French Sea Ports

WATERWAYS AND HARBORS

Levees

facilities of Cette, on the south coast of France.

French Seaports

American Railway Yard and Terminal Development in France Presents Many New Problems (84388). Robert K. Tomlin, Jr. 1800 w. Eng News-Rec—Feb. 21, 1918. Big construction programme at French seaports.

Les Ports Maritimes I (82655 B). Ills. 3100 w. La Nature—Oct. +, 1917. Channel ports, especially Havre.

German Waterways

Lesson of the German Waterways (86436). 2000 w. Naut Gaz—May 25, 1918. Empire's commercial progress ascribed to development of rivers and canals.

Harbors

Harbor for the River Murray Valley (84131 N). Major Johnston. 1500 w. Comwh Engr—Jan., 1918. Schemes for improvement of mouth of the largest river in Australia, and other projects.

St. John Harbor (88990). Alex. Gray. Read before Eng. Inst. of Canada. 2000 w. Can Engr—Sept. 19, 1918. Explains conditions and the harbor development.

Harbor Improvements for Imperial Trade (83132 A). 1500 w. Engng—ports. Lord D'Abernon's work.

Havana

El Problema del Agua en la Habana (84600 A). 7500 w. Rev Sociedad Cubana De Ingenieros—Jan., 1918. Report of a Commission on improved water supply for Havana, Cuba.

Havre

Les Projets D'Extension Du Port Du Havre (84594 B). A. Dumas. Ills. Colored plate. 5200 w. Le Génie Civil—Dec. 22, 1917. New projects for harbor and waterfront development at Havre, France.

Holland

De scheepvaartweg van Amsterdam naar den Rijn (88403). C. A. Joles. Ills. 10,000 w. Ingenieur—June 22, 1918. Proposed ship canal from Amsterdam to the Rhine.

De verbetering van de Overrijsselsche Vecht (88402). N. C. Lambrechtsen. Ills. 11,000 w. Ingenieur—June 15, 1918. Plans for improvement of the Vecht river.

De Verbetering en Mitbreiding van de Haven van Delfzijl (82651 B). P. H. Kemper. Insert plate. 3900 w. Ingenieur—Sept. 22, 1917. Report of Commission on Improvement of the harbor of Dalfzjil.

Hydraulic Phenomena

Hydraulic Phenomena and the Effect of Spreading of Flood Water in the San

Bernardino Basin, Southern California (85318 D). 13 pp. A S C E, Pro—March, 1918. Continued discussion of A. L. Sonderegger's paper.

Ice Diversion

Ice Diversion, Hydraulic Models, and Hydraulic Similarity (88733 D). Ills. 25 pp. A S C E, Pro—Aug., 1918. Continued discussion of Benjamin F. Groat's paper.

Inland Waterways

Co-ordinated Transportation Between Railways, Ocean and Rivers (84090 A). Francis G. Newlands. 4000 w. Int Mar Eng—Feb., 1918. Plan for developing the various inland waterways of the United States.

Our Inland Waterways (86434). 4000 w. Naut Gaz—May 25, 1918. Development of terminals and facilities along the Mississippi, Ohio, and Missouri rivers.

Plans for the Development of Inland Water Transportation (86090). Walter Parker. 2000 w. Ry Rev—May 4, 1918. Argument for utilization of rivers and canals as adjuncts to the railroads.

Ireland

Belfast Harbor (83920). 1600 w. Times Engng Supp—Nov. 30, 1917. New scheme for improvement and enlargement to accommodate increased traffic.

Italy

Via D'Acqua di Grande Navigazione fra Milano ed il Lago di Como (87703 B). Ills. 4200 w. Monitore Tecnico—Apr. 20-30. Projected canal forming an inland waterway from Milan to Lake Como.

L'Opera Dell' Ufficio Idrografico Del Po (87104 B). 4900 w. Monitore Tecnico—Mar. 20, 1918. Improvement works on the River Po. Rainfall data, flow, suspended matter, etc.

Le Réseau Navigable De Milan A. L'Adriatique (82666 B). A. Goupin. Ills. 2500 w. Génie Civil—Oct. 20, 1917. Interior waterway from Milan to the Adriatic by a proposed canal and the Po River.

Lakes to Gulf

Imperative Need of the Lakes to the Gulf Deep Waterway (83495 A). H. B. Morgan. 1500 w. Mun Eng—Jan., 1918. Importance of connecting the Great Lakes with the Gulf of Mexico, through the Mississippi River.

Levees

Levee Settlement: Cause and Remedy (88315). 1200 w. Eng & Con—Aug. 21, 1918. Information from the last annual report of the Board of State Engineers of Louisiana.

Levee Construction in North Texas

Lock Gates

with Draglines (87623). O. W. Finley. Ills. 1000 w. Eng & Con—July 17, 1918. Details of levee work and land reclamation.

Lock Gates

The Distribution of Stresses in Mitering Lock-Gates, with Special Reference to the Gates on the Panama Canal (88734 D). 1500 w. A S C E, Pro—Aug., 1918. Discussion of Henry Goldmark's paper.

Locks

Construction of Concrete Lock in Hudson River at Troy, N. Y., 1916, in Charge of Col. W. M. Black, Corps of Engineers (89619 B). M. J. McDonough, and others. Ills. 42 pp. Prof Mem—Sept.-Oct., 1918. Reports on various features of the work.

Louisiana Waters

Louisiana Waters, and Their Industrial Possibilities (83014 A). Welman Bradford, with discussion. Map. 20 pp. La Eng Soc, Pro—Dec., 1917. Possibilities and proposed development.

Madras

Madras Harbour (85208). 1300 w. Times Engng Supp—Feb. 22, 1918. Construction of the West Quay, nearly 3000 ft. long, at Madras.

Mississippi

The Lower Mississippi as an Arm of the Sea (84091 A). M. von Pagenhardt. 2000 w. Int Mar Eng—Feb., 1918. Its value to the new American merchant marine.

Mississippi-Warrior

Mississippi-Warrior Waterways Service Hailed as Ushering in New Economic Era (89659). Thomas Ewing Dabney. 2000 w. Mfrs Rec—Oct. 24, 1918. Prospects of this new service for which the government appropriated some \$8,000,000.

Monongahela

Monongahela River Navigation (87555 B). H. W. Stickle, with discussion. Ills. 33 pp. Engrs' Soc W Penn, Pro—April, 1918. Results obtained by canalization; the business of the river; improvements needed, etc.

Newcastle, N. S. W.

Newcastle Harbor Improvements. N. S. W. (84998 N). Ills. 2500 w. Comwh Engr—Feb. 1, 1918. Providing for industrial development.

New Orleans

New Orleans Builds Inner Harbor and Navigation Canal (88244 A). Ills. 2500 w. Eng News-Rec—Aug. 15, 1918. Construction of ocean docks and industrial sites on fixed level waterway.

New York

Joint Commission Rushes Study of Port

WATERWAYS AND HARBORS**Rhine**

of New York (88480 A). 1500 w. Eng News-Rec—Aug. 29, 1918. Engineering investigation of railways, steamships, lightering and trucking.

Solving New York's Port Problems (89142 A). Benjamin A. Howes. Map. 2500 w. Mar Rev—Oct., 1918. Proposal for relieving freight congestion at this port.

New Zealand

Shipping and Navigation in the Port of Otago, N. Z. (88144 N). McG. Wilkie and J. Blair Mason. Ills. 1500 w. Comwh Engr—July, 1918. Abstracted from official reports.

Ostia

Roma Porto di Mare e la Ferrovia Roma-Ostia (89057 B). G. Tian. Ills. 3300 w. Monitore Tecnico—Aug. 10, 1918. Serial, 1st part. Ostia, the port of Rome. Canal and railway connections.

Panama Canal

Tests of the Chain Fenders in the Locks of the Panama Canal (85700 N). Henry Goldmark. Ills. 19 pp. Can Soc C E—March 28, 1918. Tests made during the construction of the fenders, and since the canal has been in use.

Pacific Coast

The Neglected Waters of the Pacific Coast—Washington, Oregon, and California (83794 N). E. Lester Jones. Ills. & Maps. 16 pp. U S Dept Com—Special Pub. No. 48. Shows present-day conditions and the remedy.

Piers

Norfolk of Western Builds Terminal Piers at Norfolk (86290). F. P. Turner. Ills. 3500 w. Eng News-Rec—May 16, 1918. Timber sub-structure with steel-frame shed.

Piling

See same heading under Materials of Construction.

Ports

Ports and Terminal Facilities (85570 A). R. S. MacElwee. Ills. Also discussion by George S. Webster. 10500 w. E Cb Phila, J1—April, 1918. Their importance, efficiency, requirements, etc.

Ports of the Empire (84145 A). 1500 w. Engr—Jan. 18, 1918. Serial, 1st part. Information from report of the Dominions Royal Commission in regard to dock and harbor facilities.

Rhine

The Freedom of the Rhine (88854 A). 2000 w. Engr—Aug. 23, 1918. German project to canalize the Rhine and the objections of Switzerland.

De bevaarbaarmaking van den Duit-schen Boven-Rijn (89052 B). C. A. Jolles. 3200 w. Ingenieur—July 6, 1918. Im-

Rhône

improvements in the upper (German) Rhine to facilitate navigation, or Germany only.

Rhône

Le Rhône (87733 B). A. Koehler. Ills. 2300 w. La Nature—June 1, 1918. Industrial migration in Southern France due to power development of River Rhône. River improvement projects.

Rivers

Improvements at the St. Maurice River Outlet—Western Branch (82617). Romeo Morrisette. Ills. 500 w. Can Engr—Nov. 22, 1917. Details of work.

St. Lawrence

Notes Upon Survey and Investigation of St. Lawrence River Rapids (82496 A). Albert B. Cudebec. Map & Ills. 15 pp. Corn C E—Oct., 1917. Methods of work.

St. Thomas

The Port of St. Thomas (85874). 1200 w. Naut Gaz—Mar. 28, 1918. Manifest advantages and future prospects under U. S. control of this West India island.

San Francisco

Improving Golden Gate Port (88559 A). Cruse Carriel. Ills. 800 w. Mar Rev—Sept., 1918. Improvements at San Francisco.

Seattle Port

The Port of Seattle (89314 A). Charles Philip Morton. Ills. 700 w. Int Mar Eng—Oct., 1918. A terminal harbor of unusual excellence.

Scotch Canals

Mid-Scotland Ship Canals (83637 A). Maps & Ills. 3000 w. Engr—Dec. 21, 1917. Serial, 1st part. The Loch Lomond scheme is discussed in the present article.

Scotland

Mid-Scotland Ship Canal (85266 A). 1500 w. Engr—March 1, 1918. Commercial aspects of the schemes; industrial developments, etc.

Sea Walls

Repainting Sea Wall at Governors Island, N. Y., with Cement Gun (88364 B). Henry N. Babcock. Ills. 9 pp. Prof Mem—July-Aug., 1917. Details.

Stream Control

A Novel and Economic Method of Controlling Streams (89459). Halbert P. Gillette. Ills. 700 w. Eng & Con—Oct. 9, 1918. System of "check" dams invented by Alvaro A. Pratt.

Suez

Het Suezkanaal in 1917 (89053 B). W. F. Leemans. 1300 w. Ingenieur—July 13, 1918. Traffic of Suez Canal for 1917. Nationalities and tonnage represented.

Suez Canal

Suez Canal Company's Report for

WATERWAYS AND HARBORS

Weirs

1917 (87362). 1200 w. Naut Gaz—July 6, 1918. Extract from the annual report, showing the effect of the war.

Surface Waters

Ice Diversion, Hydraulic Models, and Hydraulic Similarity (83270 D). Benjamin F. Groat. Ills. 3000 w. A S C E, Pro—Dec., 1917. New method of diverting surface water and all floating materials to prevent jams in canals and rivers.

Sweden

Malmö's Future Free Port (87525). 2500 w. Naut Gaz—July 13, 1918. Contemplated improvements to and equipment of Industrial Harbor in Sweden.

Switzerland

Der Basler Rheinhafen bei Kleinhüningen (82653 B). Ills. 2100 w. Schweizerische Bauzeitung—Oct. 20, 1917. Improvement of the Rhine waterfront at Basle. New railway terminals, docks, etc.

Terminals

Marine Terminals for Inland River Cities Located on High Ground (88056 A). H. M. L. Harding. Ills. 2000 w. Int Mar Eng—Aug., 1918. Principles governing construction of efficient river terminals.

Trent

Trent Navigation Improvement (86488). Ills. 1300 w. Times Engng Supp—Apr. 26, 1918. Proposed improvement of river Trent between Nottingham and Newark, England.

United States

The Commercial Waterways of the United States (84485 B). John Mills. 2500 w. Prof-Mem—Jan.-Feb., 1918. Demand for promoting their greater utilization.

Valparaiso

Deep-Water Moorings in Valparaiso Bay (87476 N). Henry Charles Anstey. Ills. 10 pp. Instn C E, Pro—Paper No. 4216. Explains conditions and the problem of moorings in the bay.

Water Level

Der Watersnood van 1916 en Zijn Gevolgen (83312 B). C. J. A. Reigersman. Ills. 14,000 w. Serial, 1st part. Ingenieur—Oct. 20, 1917. Discussion of flood conditions and mean water level in Dutch interior waterways. Engineering work, surveys, etc.

See also TRANSPORTATION PROBLEMS under Roads and Pavements.

Weirs

The New Fall Creek Weir (86144 A). W. G. McClintock. Ills. 1200 w. Corn C E—March, 1918. Details of construction.

Wharf Supports

Permit Weir in St. Lawrence (88987). 2000 w. Can Engr—Sept. 19, 1918. Decision of the International Joint Commission granting permission to the St. Lawrence River Power Co. to build a submerged weir.

Canada Protests Against Weir in St. Lawrence (88659). 2200 w. Can Engr—Sept. 5, 1918. Gives objections set forth.

Wharf Supports

Concrete Wharf Supports in San Francisco Harbor (88365 B). Thomas S. Williams. 6 pp. Prof Mem—July-Aug., 1917. Describes concrete piles and concrete cylinders, giving experience with both.

MISCELLANY**Maneuvers****Wharves**

The Rational Design of Reinforced Concrete Wharves and Jetties, with Particular Reference to Those for Wet Docks That Have a Permanent Water-Level (84558 N). W. Cleaver. Ills. 28 pp. Per-Way Inst, Jl—Dec., 1917. Read before Concrete Inst., London. Treats of details in the order of carrying out the work.

Zeebrugge

L'Embouteillage Des Entrées Des Ports D'Ostende et de Zeebrugge (87132 B). A. Poidloue. Ills. 4600 w. Génie Civil—May 4, 1918. Closing of the harbor entrance to Zeebrugge and Ostend by the British raid.

MISCELLANY**A S C E**

The Activities of the American Society of Civil Engineers During the Past Twenty-five Years (83271 D). Charles Warren Hunt. Ills. 75 pp. A S C E, Pro—Dec., 1917. Review of the most interesting accomplishments.

China

The Commercial Development of Engineering in China (83199 A). S. W. B. McGregor. Map. 2000 w. Elec'n—Dec. 7, 1917. Serial, 1st part. Changes in progress and modern improvements being introduced.

Engineers

Awakening Recognition of the Engineer (83209). Fraser S. Keith. 1700 w. Eng News-Rec—Dec. 27, 1917. Extracts from address before Can. Soc. of Civ. Engrs. The status and future of the engineering profession.

Address at the Annual Meeting, January 16th, 1918 (84944 D). George H. Pegram. 3000 w. A S C E, Pro—Feb., 1918. Presidential address. Public service of engineers.

The Engineer in War (86427 A). J. F. Mangold. Ills. 14 pp. Palasapa Qr—April, 1918. Phases of the work and achievements.

Engineers' Work

Railway Regiment Handles Jobs of All Kinds in France (85561). Robert K. Tomlin, Jr. Ills. 2500 w. Eng News-Rec—April 11, 1918. Some of the work undertaken by American engineers.

Engineer Troops

The Organization and Duties of Engineer Troops in the European War (86286 A). C. S. Sperry. 2500 w. Univ Col Jl Eng—April, 1918. Survey of the work of the engineer troops.

Engineering Council

An Engineering Council Now Almost Forgotten (85912). F. H. Newell. 2800 w. Eng News-Rec—April 25, 1918. Organized in 1886 to promote an improved system of public works.

Explosions

Zones of Silence in Sound Areas from Explosions (85074 B). Charles E. Munroe. Ills. 2500 w. Prof Mem—March-April, 1918. Testimony showing the erratic behavior of sound.

Fortifications

Old and New Opinions About the Value of Permanent and Fortified Positions (87840 B). 24 pp. Prof Mem—July-Aug., 1918. Serial, 1st part. Their advantages and disadvantages, method of employment and defense, etc.

Hering; Rudolph

Looking Back Half a Century (88087 A). Charles Whiting Baker. Photograph. 2500 w. Eng News-Rec—Aug. 8, 1918. Biographical sketch of Rudolph Hering.

Land Clearing

Method and Cost of Clearing Cut Over Land With Powder (83139). Ills. 2500 w. Eng & Con—Dec. 19, 1917. Results obtained by the use of blasting powder in Idaho.

Method of Burning Stumps in Place in Land Clearing (83140). From paper by I. D. Charlton. 1500 w. Eng & Con—Dec. 19, 1917. Methods that have been tried in Washington.

Maneuvers

Use of the General Reserve in Grand Tactic Maneuvers as Illustrated in the Russo-Japanese War (84484 B). W. A. Mitchell. Maps. 38 pp. Prof-Mem—Jan.-Feb., 1918. Study of the use of the final reserve.

MISCELLANY

Warfare

Military Engineering

A Visit to the English Front in France (88367 B). D. Victoriano Casajus. Ills. 27 pp. Prof Mem—July-Aug., 1917. Serial, 1st part. Impressions from observations of conditions prevailing there.

Military Engineering

Battle Front Transportation (86503 B). Roger Haydock. Ills. 29 pp. Prof Mem—May-June, 1918. System of railways, roads, and cableways put in operation.

Some Notes on the Turkish Trenches at Sannoyait (86502 B). W. H. Lang. Ills. 1800 w. Prof Mem—May-June, 1918. Describes the country and the trenches.

Suggestions on Trench Construction, etc. (86504 B). H. D. Trounce. 18 pp. Prof Mem—May-June, 1918. Various kinds of trenches, drainage, shelters, camouflage, transport, etc.

The Influence of Topography Upon the Strategy of the European War (86240 A). Frederick K. Morris. Ills. 5500 w. E Cb Phila, J1—May, 1918. Interesting explanation of why certain fields for battles were chosen.

Trench Organization (86505 B). Rene Radiguet. Ills. 18 pp. Prof Mem—May-June, 1918. From "The Making of a Modern Army and Its Operations in the Field." General plan of an intrenchment system.

Tunnels and Galleries (86501 B). From *La France Militaire*. 800 w. Prof Mem—May-June, 1918. Works constructed by the Germans and also by the Allies. Design, construction and materials employed.

Military Engineering

Fighting with Fire in Ancient Times (80645 A). H. H. Manchester. Ills. 1800 w. Am Mach—Oct 24, 1918. Illustrations from old plates and description of early methods.

The Balkan Theatre of War (89620 B). Douglas Wilson Johnson. Maps & Ills. 30 pp. Prof Mem—Sept.-Oct., 1918. From "Topography and Strategy in the War."

Fortifications as Dependent Upon Advances in Human Knowledge (89621 B). C. T. Sacket. Ills. 22 pp. Prof Mem—Sept.-Oct., 1918. Improvements in weapons causing modifications in methods of attack and defense.

Liaison of Divisional Engineers With the Other Troops (84488 B). Major Rousseau. 3500 w. Prof-Mem—Jan.-Feb., 1918. Duties of engineer troops.

The Work and Experiences of the United States Engineer Troops in France (84325 A). Charles M. Clement. 8000 w. E Cb Phila, J1—Feb., 1918. Account from one recently returned from the firing line in France.

Sandbox Instruction

Sandbox Instruction in Fortification, Reconnaissance and Minor Tactics (87837 B). V. L. Peterson. Ills. 20 pp. Prof Mem—July-Aug., 1918. Field fortification instruction and advantages to officers.

War

The United States and the Far East (87086 N). A. Gerard. Translated from *Rev. des Deux Mondes*. 16 pp. Roy Un Serv Instn, J1—May, 1918. Examines the rôle of the United States in the Far East.

Wolfe-Barry, Sir John

The Late Sir John Wolfe-Barry (84286 A). 4500 w. Engng—Jan. 25, 1918. Biographical sketch.

Trench Fighting

Organization and Duties for Trench Fighting (82532 B). O. N. Solbert and George Bertrand. Ills. 50 pp. Prof-Mem—Nov.-Dec., 1917. Fortifications; organization, etc.

Tropics

Engineering in the Tropics (83159 A). Leslie E. Miner. Map & Ills. 3000 w. Univ Col J1 Eng—Oct., 1917. Experiences in building the Madeira-Mamoré Railway.

Warfare

The War on Land and Sea (84855 A). William L. Cathcart. Ills. 16 pp. E Cb Phila, J1—March, 1918. Review of important points.

ELECTRICAL ENGINEERING

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COMMUNICATION

Audion

What Happens in an Audion (82612 A). J. B. Will. Ills. 5000 w. U S Nav Inst, Pro—Nov., 1917. Physical characteristics and action explained.

Automatic System

The First Automatic Installation (89171). 700 w. Ills. Telephony—Sept. 28, 1918. Describes the earliest automatic telephone system, installed in La Porte, Ind., 25 years ago.

Automatic Telephone

Automatic Telephones At Leeds (87151). 1000 w. Times Engng Supp—May, 1918. New automatic exchange recently put in operation in Leeds, England.

Leeds Automatic Telephone Exchange (86828 A). Ills. 1500 w. Elec Rev—May 24, 1918. Full automatic of the Strowger type, for a five figure system.

Cables

Aerial Cable Construction Kinks (88105). Ills. 1500 w. Telephony—Aug. 10, 1918. New methods and devices developed which facilitated rapid placing of cable.

Computing the Speed of Receiving a Telegraphic Message Through Submarine Cables (87395 A). J. Rymer-Jones. 1600 w. Elec Rev—June 14, 1918. Explains method and its advantages.

Compensation Agreement

Sample Compensation Agreement (89606). 4500 w. Telephony—Oct. 19, 1918. Form of instrument providing for just compensation accepted by the Postmaster-General and one company.

Conductors

Some Experiments With Long Electrical Conductors (83161 D). John H.

Interference

Morecroft. Ills. 24 pp. Inst Rad Engrs, Pro—Dec., 1917. Study of conductors which may prove useful in calculating antenna oscillation period.

Consolidation

The Los Angeles Consolidation (89293). 3000 w. Telephony—Oct. 5, 1918. Problems involved in effecting a consolidation of the automatic and manual exchanges.

Disturbances

Disturbance of Telegraphic Communication in the Rhone Valley Through the Operation of the Lötschberg Electric Railway (82296 A). M. Dumermuth, in Elektro. Zeit. (Abstract translation.) Ills. 900 w. Elec'n—Oct. 26, 1917. Experiments carried out to determine the nature and cause of the disturbances and their removal.

Federal Control

Compensation Contracts Ratified (89477). Stanley R. Edwards. 3500 w. Telephony—Oct. 12, 1918. Details of basis of compensation regarding rental of properties during federal control.

Interference

Interference by High Power Lines (99669). H. C. Don Carlos. 2500 w. Telephony—Oct. 26, 1918. Features of value to rural telephone companies.

Interference — Its Legal Status (87026 A). J. A. Whitlow. 5000 w. Tel Engr—June, 1918. Read before Univ. of Missouri, A. I. E. E.

Iowa Inductive Interference Case (87059). Harold L. Beyer. 3000 w. Telephony—June 22, 1918. Decision of Iowa Railroad Commission in Iowa High Tension case, and other legal questions.

Consult Classification of the Index. See page 9.

Loading Coils

Final Report on Inductive Interference (83627 A). 2500 w. Tel Engr—Jan., 1918. Review of the work of the California Joint Committee.

Loading Coils

Loading Coils versus Repeaters (82996 A). W. N. Furthman. 2500 w. Tel Engr—Dec., 1917. Serial, 1st part. Properly designed and correctly installed, loading coils are adequate for all long distance work.

Loading Coils versus Repeaters (84224 A). W. N. Furthmann. Ills. 2500 w. Tel Engr—Feb., 1918. Serial, 1st part. Properly designed and correctly installed loading coils adequate for long distance.

Military Communication

Telegraphs and Telephones in the First Year of War (84298). John V. L. Hogan. 1500 w. Elec Wld—Feb. 16, 1918. Organized for war service.

Orders

Issued by Postmaster General (89607). 2500 w. Telephony—Oct. 19, 1918. Compilation of all bulletins and orders issued since the government assumed control and operation of the telephone systems.

Phantom Circuit

Principle and Theory of Phantoms (85471). S. A. Kraus. 1800 w. Telephony—April 6, 1918. Conditions which may be relieved by phantom circuits. Read at Ohio convention.

Power Plants

The Figuring of the Power Plant (84978). P. A. Price. Ills. 5500 w. Telephony—March 16, 1918. Data required for determining power plant for common battery exchanges.

Radiotelegraphy

Wireless Transmitting Stations on German Aeroplanes (83740 A). From La Nature. Elec Rev—Dec. 28, 1917. Brief description.

Oscillation Valve Detectors for Wireless (88040 A). Dr. J. A. Fleming, in London Times. Ills. 2500 w. Tel Engr—Aug., 1918. Application and properties.

L'Etat Actuel De La Radiotélégraphie (88432 B). L. Bouthillon. Ills. 5600 w. Génie Civil—Aug. 3, 1918. Serial, 1st part. Present development of radiotelegraphy and its applications.

Comparative Experiments on the Audion (84281 A). G. Vallouri. Diagrams. 1000 w. Elec'n—Feb. 1, 1918. Experiments made with five samples to determine their relative behavior as amplifier, generator, and detector in radiotelegraphy.

Municipal Regulations Covering Radio Stations (83163 D). Ellery W. Stone. Ills. 3000 w. Inst Rad Engrs,

COMMUNICATION**Repeaters**

Pro—Dec., 1917. Discussion of Robert H. Marriott's paper on "Engineering Precautions in Radio Installations."

Distributed Inductance of Vertical Grounded Antennas (83162 D). A. Press. Ills. 500 w. Inst Rad Engrs, Pro—Dec., 1917. A study of the variation of distributed inductance.

On the Phenomena in Resonance Transformer Circuits (83165 D). Hidetsugu Yagi. 13 pp. Inst Rad Engrs, Pro—Dec., 1917. Reviews previous work and develops the solutions for the cases of one and two sparks per cycle.

The Manufacture of Vacuum Detectors (83164 D). O. B. Moorhead, with discussion. 2000 w. Inst Rad Engrs, Pro—Dec., 1917. Experiments and details of manufacture and testing.

Internal Relations in Audion-Type Radio Receivers (82293 A). Ralph Bown. Diagrams. 3500 w. Elec'n—Oct. 26, 1917. Experimental curves are shown from which the details of the operation of the audion as a detector are followed.

I Moderni Sistemi di Trasmissione Radiotelegrafica (82650 B). 2000 w. Mon Tecnico—Oct. 10, 1917. Descriptive outline of new system for long distance transmission, employing wave lengths of 6,000 meters.

Radiotelegraphy and Radiotelephony (84988 B). S. M. Kinter. Ills. 29 pp. Engrs' Soc W Penn, Pro—Dec., 1917. The part radiotelegraphy is playing in the ar, with outline of the theory.

Radio Inductive Interference (85335). Ellery W. Stone. Ills. 700 w. Telephony—March 30, 1918. Discussion of effect on telephone lines of inductive interference from radio stations.

Rates

Hotel Telephone Service Rates (89478). 5000 w. Telephony—Oct. 12, 1918. Order of the Massachusetts Public Service Commission. Hotel service at regular rates.

Rectifier

A rectifier for Telephone Use (83591). Ills. 1500 w. Telephony—Jan. 12, 1918. Details of Tungar rectifier and its operation.

Reis Telephone

Reis Telephone and Nature of Sound (83851). Articles by Arthur Bessey Smith and by J. G. Mitchell. 1800 w. Telephony—Jan. 26, 1918. Discussions of the "break and make" theory of the Reis telephone in regard to its relation to sound.

Repeaters

See Loading Coils.

COMMUNICATION

Telephony

Research

Industrial Research with Some Notes Concerning Its Scope in the Bell Telephone System (83629 A). F. B. Jewett. 6000 w. Tel Engr—Jan., 1918. Read at Philadelphia meeting of the A. I. E. E.

Industrial Research with Some Notes Concerning Its Scope in the Bell Telephone System (82508 D). F. B. Jewett. 14 pp. A I E E, Pro—Nov., 1917. Outlines the scope and progress.

Ringling Equipment

Central Office Ringling Equipment (88455). P. A. Price. Ills. 3000 w. Telephony—Aug. 24, 1918. Serial, 1st part. Practical explanation of electrical theory of Central Office ringling, and equipment developed.

Service Charge

Service Connection Charge Ordered (88667). 2000 w. Telephony—Sept. 7, 1918. Postmaster-General orders telephone companies to charge for installation of telephones for new subscribers and for moving instruments.

Signal Corps

Field Signal Corps Battalions (82332). Stanley R. Edwards. Ills. 4000 w. Telephony—Nov. 10, 1917. How men are being prepared for active service.

Specifications

Railroad Crossings (82307 A). 6000 w. Tel Engr—Nov., 1917. Specifications prepared by the Public Service Commission of Pennsylvania.

Telephone Conduits

Construction Methods and Equipment Employed in Construction of Suburban Telephone Conduits (86124 A). Ills. 1500 w. Min Eng—May, 1918. Data on construction with trenching machine in suburban districts.

Telegraphy

I Telegrafi In Italia (86464 B). I. Brunelli. 1000 w. L'Industria—Mar. 31, 1918. Development and status of the telegraph system in Italy.

Telephone Practice

Semi-Automatic Telephone System at Amsterdam (84225 A). From *Am. des Telegraphes et Telephones*. 3300 w. Tel Engr—Feb., 1918. Reasons for adopting this system; method of service, etc.

Telephone Work

Trucks, Trailers and Special Bodies (84223 A). Ills. 4500 w. Tel Engr—Feb., 1918. Miscellaneous motor cars and attachments found useful to telephone men.

Telephony

Compensation for Government Control (88719 A). F. B. MacKinnon. 4500 w. Tel Engr—Sept., 1918. Statement given

to the press at midnight July 31, by Postmaster General Burleson, with discussion of the problem of compensation for use of the properties.

Costs of Special Service and Plant (88529). Ward H. Snook. 1200 w. Telephony—Aug. 31, 1918. Accounting system.

Transmission of Cord Circuits (86057). Walter C. Freeman. 3000 w. Telephony—June 8, 1918. Various types of magneto cord circuits.

Telephone Exchange Transfers and Their Organization (88385 N). F. G. C. Baldwin, with discussion. Ills. 46 pp. Instn E E, JI—June, 1918. Operations for actual transfer and engineering processes customarily accompanying the work.

Manual, Automatic, or Semi-Automatic? (86235 A). F. A. Wolff and G. S. Macomber. 8 pp. Tel Engr—May, 1918. Discussion of the relative advantages and limitations. United States Bureau of Standards report on the Washington situation.

Traffic Conditions and the Manager (86325). W. I. Howard. 2500 w. Telephony—May 18, 1918. Mechanical operation of the plant as distinguished from its manual operation. Relations of manager to the traffic requirements.

I Telefoni In Italia (86461 B). L. A. Zanni. 3200 w. L'Industria—Mar. 15, 1918. Development and growth of the telephone system in Italy.

A Clearing House for Local Tolls (85766). B. E. Miller. 2000 w. Telephony—April 20, 1918. Read at convention of Wis. Telephone Assn. Discussion of local calls and the classification of long distance and local toll messages.

Loading Coils vs. Repeaters (85569 A). W. N. Furthman. Ills. 2500 w. Tel Engr—April, 1918. Properly designed and correctly installed, loading coils are adequate for all long distance work. Serial, 1st part.

Transmission Efficiencies of Cord Circuits (85568 A). Walter C. Freeman. Ills. 3000 w. Tel Engr—April, 1918. Ways and means of improving the electrical properties of circuits.

Telephone Exchange Transfers and Their Organization (84280 A). F. G. G. Baldwin. 3500 w. Elec'n—Feb., 1918. Abstract of paper before the I. E. E. Ways and methods of effecting transfers.

Some Recent Improvements in Telephony (83628 A). Ray H. Manson. Ills. 5000 w. Tel Engr—Jan., 1918. Review of progress. Read at Rochester meeting of A. I. E. E.

The Marvel of the Telephone (83630 A). J. F. Greenawalt. 3000 w.

Train Telephones

Tel Engr—Jan., 1918. Read at meeting of New Mexico Electrical Assn. The story of its invention and development.

Recent Progress in Telephony (82995). Ray H. Manson. 5500 w. Telephony—Dec. 15, 1917. Presented at Rochester meeting of A. I. E. E. Trend of improvements advocated.

Telephone Regulation in Illinois (82875). T. E. Dampcy. 3500 w. Telephony—Dec. 8, 1917. Questions in connection with state regulation of telephone companies.

Telephone Development in the World at the Beginning of 1917 (82283 A). W. H. Gunston, in Telegraph & Telephone JI. 500 w. Elec'n—Oct. 19, 1917. An estimate.

Train Telephone

Telephone Reaches a Moving Train (86102 A). Ills. 1400 w. Ry & Loc Eng

ELECTRO-CHEMISTRY**Chemistry**

—May, 1918. Test made by the Canadian Government.

Telephoning to a Moving Train (84077 A). Ills. 800 w. Ry & Loc Eng—Feb., 1918. Appliances and system in use on Canadian Government railways.

Transmitters

Granular Carbon for Transmitters (89170). H. R. Van Deventer. Ills. 1500 w. Telephony—Sept. 28, 1918. Requirements as to electrodes, preparation of carbon, its handling, etc.

Transposition Systems

See same heading under TRANSMISSION AND DISTRIBUTION.

Trunking

Estimating Trunking Requirements (87527). H. A. Buxton. 1200 w. Telephony—July 13, 1918. Method for rapidly and accurately estimating the trunking requirements for call, circuit, ring-down, or automatic trunk groups.

ELECTRO-CHEMISTRY**Alkali Works**

Alkali Works for Australia (89519 A). 1800 w. Aust Min Std—Sept. 12, 1918. Chemical firms coöperate to establish industry for manufacture of caustic soda, chlorine, bleaching powder, etc.

Batteries

High-Potential Batteries for Supplying Small Currents (82281 A). Frank Horton. Abstract from Phil. Mag. 1000 w. Elec'n—Oct. 19, 1917. Types used.

Batteries

Large Storage Batteries (86490). 1500 w. Times Engng Supp—Apr. 26, 1918. Use of such batteries in power stations.

Canada

Notes on Electro-Chemical and Metallurgical Possibilities in Canada (84525 N). H. E. Howe, with discussion. 3500 w. Can Min Inst, Trans—1917. Utility of hydro-electric power, and the future of industries named.

Carbon Cells

An Experimental Carbon Cell (85828 N). S. Albert Reed. Ills. 1200 w. Am El-Chem Soc—April-May, 1918. Describes apparatus.

Cells

Discharge Characteristics of a Certain Make of Dry Cell (89455 N). C. A. Gillingham. 28 pp. Am El Chem Soc—Oct., 1918. Study of 6x15 cm. cell.

Cells

Dry Cells and the Wet Batteries (84808). William J. Herdman. 4000 w.

Telephony—March 9, 1918. Primary and secondary types of cells. Construction of dry cells and their care.

Chemical Industry

Abstract of the Census of Chemical Manufactures (89354 A). 16 pp. Chem & Met Eng—Sept. 24, 1918. Comparative statistical analysis of U. S. census taken in 1909 and 1914—Production and financial data on chemical industries.

The Chemical Industry in Export Trade (89351 A). G. A. O'Reilly. 1800 w. Chem & Met Eng—Sept. 24, 1918. Essentials for success comprise finding a market, catering to its requirements, and meeting competition.

The Economic Importance of Our Chemical Industry (89352 A). Frederick A. Clawson. 5500 w. Chem & Met Eng—Sept. 24, 1918. Review showing expansion to meet war demands.

War Disturbances and Peace Readjustments in the Chemical Industries (89353 A). Grinnell Jones. 3500 w. Chem & Met Eng—Sept. 24, 1918. View of the dislocations of normal trade and industry caused by the war.

Chemical Industry

Organisation of Chemical Industry After the War (82660 A). 1600 w. Nature—Oct. 11, 1917. Conditions to be met in England in chemical industries.

Chemistry

Germany's Stolen Chemistry (88345). Townes R. Leigh. 2500 w. Mfrs Rec—Aug. 22, 1918. Important scientific discoveries and industrial processes of all

Corrosion

nations that have been appropriated by the Germans.

Copper Precipitation

The Effect of Iron Sulphate in the Electrolytic Precipitation of Copper from Sulphate Solution with Insoluble Lead Anodes (86972 N). Edward F. Kern. 11 pp. Am El Chem Soc—April, 1918. Experimental investigations and results.

Corrosion

Typical Cases of the Deterioration of Muntz Metal (60:40 Brass) by Selective Corrosion (82443 F). Henry S. Rawdon. Ills. 5500 w. A I Mt, JI—Sept., 1917. Illustrated by five types, including tubing, sheets, and forgings.

Corrosion (83126). A. Schleimer. 1500 w. Brs Wld—Dec., 1917. Rust preventive processes.

Fence Wire Corrosion and Its Causes (82987 A). Oliver W. Storey. 3000 w. Iron Age—Dec. 13, 1917. From paper before Elec. Chem. Soc. Influence of copper. Results of study.

Corrosion of Iron and Steel and Its Prevention (84747). Abe Winters. 1500 w. Can Fndman—Feb., 1918. Serial, 1st part. Relative corrosion, etc.

"Density Cell"

A "Density Cell" with Slight Local Action (84138 A). Ch. Fery. Abstract of paper read before the Soc. Int. des Elec'ns. Ills. 2500 w. Elect'n—Jan. 18, 1918. Experiments designed to provide a remedy for the irregular local action of the negative electrode.

Depolarizing

Pile A Dépolariation Par L'Air (84592 C + D). M. Féry. Ills. 1200 w. Bul-Soc D'Encouragement Pour L'Industrie Nationale—Sept.-Oct., 1917. Voltaic cell with manganese dioxide electrolyte arranged to depolarize the negative plate by allowing access of air.

Electric Furnace

A vom Baur Arc Furnace (86974 N). J. H. vom Baur. Ills. 6 pp. Am El Chem Soc—April, 1918. A new design for melting ferro-manganese or ferro-silicon, or melting down cold charges for steel castings.

The Booth-Hall Electric Furnace (86973 N). W. K. Booth. Ills. 10 pp. Am El Chem Soc—April, 1918. A newly-designed electric steel furnace of the vertical-arc type with conducting hearth.

The Greaves-Etchells Electric Furnace (84148 A). Ills. 1500 w. Engr—Jan. 18, 1918. Detailed description and advantages claimed.

ELECTRO-CHEMISTRY Electrochemical Industries**Electric Furnaces**

Metallurgical Electric Furnaces (88394 A). Ills. 2500 w. Engng—July 26, 1918. Serial, 1st part. Deals particularly with iron and steel furnaces. Based on a discussion before the Faraday Society.

Notes on Electric-furnace Problems (89573 D). J. L. McK. Yardley. 1400 w. A I M E, Bul—Oct., 1918. Analysis, made to determine the maximum capacity and approximate performance of a new furnace, to operate at 160 volts on a 60-cycle circuit.

Electrodes for Electric Furnaces: Their Manufacture, Properties, and Utilization (89433 A). Jean Escard. 5500 w. Gen Elec Rev—Oct., 1918. Serial, 1st part. Trans. from Le Genie Civil. Present article describes the raw materials from which electrodes are manufactured, the process, and some of the characteristics of carbon electrodes.

Electric Furnaces for Heat Treatment (86146 A). T. F. Baily. Abstract of paper before Cleveland Soc. of the Assn. of Iron and Steel Elec. Engrs. Ills. 2500 w. Iron Age—May 9, 1918. Types of resistance furnaces.

Fulton's Electric Zinc Furnace (86305 A). Ills. 1500 w. Met & Chem Eng—May 15, 1918. Details of a zinc smelting process devised by Charles H. Fulton.

Stobie 15-Ton Electric Furnace (86393 A). Ills. 2500 w. Ir & Cl Trds Rev—Apr. 12, 1918. Commercial possibilities of large as compared with small electric furnaces, with description of furnaces named.

Electric Furnace Facts and Practice (83083 A). D. D. Mac Guffie. Read before British Found. Assn. 2500 w. Jr & Cl Trds Rev—Nov. 30, 1917. Practice with a 3-ton Héroult furnace.

Small Electric Furnaces and Their Uses (82839 A). Charles R. Darling. Ills. 1700 w. Engr—Nov. 16, 1917. Improvements that have increased their usefulness. Cost of running; types, etc.

Electrochemical Industries

Electrochemical Industries and the War (85903). G. A. Roush. 2500 w. Mfrs' Rec—April 25, 1918. Information concerning electrochemical products for war uses.

Central Stations and the Manufacture of Electrochemical Products (85361 A). C. A. Winder. 3000 w. Met & Chem Eng—April 1, 1918. Address at Dayton meeting of Ohio Elec. Lgt. Assn.

The Future of the American Electrochemical Industry (86298 A). S. W. Maher. 1300 w. Met & Chem Eng—May 15, 1918. Factors likely to affect the future development, with particular reference to advantages offered by the South.

Electrochemistry

ELECTRO-CHEMISTRY

Electrometallurgy

The Possibilities for the Development of Chemical Industries in the Southern States (85996 A). Richard K. Meade. 3500 w. *Met & Chem Eng*—May 1, 1918. Survey of the power, fuel and basic raw materials suitable for chemical development.

Nature's Gift to the Electrochemist at Muscle Shoals (85992 A). Willis G. Waldo. Ills. 2500 w. *Met & Chem Eng*—May 1, 1918. Outlines the hydro-electric project on the Tennessee River, reviewing the universal resources of the region and the possible development of industry.

Electrochemistry

Electrochemistry and National Economy (89458 N). Colin G. Fink. 5 pp. *Am El Chem Soc*—Oct., 1918. The resources of the South and the achievements of the electrochemist.

Electrometallurgy

Electric Steel Making (88500 A). Arthur V. Farr. Ills. 2000 w. *Machy*—Sept., 1918. Importance and growth of this industry.

Electrodes

The Sign of the Zinc Electrode (88305). Wilder D. Bancroft. 2200 w. *Br Wld*—Aug., 1918. Reviews the positions of German physical chemists as to the sign to be applied to the zinc electrode, and discusses the problem.

Electrolytic Process

Electrolytic Oxygen and Hydrogen (88163 N). 9 pp. *Trav Stand*—July, 1918. Precautions for safety in the manufacture.

Electrolysis

Electrolysis (87576 A). D. W. Roper. Abstract of paper before A. E. S. of St. Louis. 14 pp. *E Cb St L, JI*—May-June, 1918. A comparison of conditions in St. Louis and Chicago.

Protecting the Panama Lock Valves Against Electrolysis (87213). R. H. Whitehead. 1500 w. *Eng News-Rec*—June 27, 1918. Wood separators and protective coatings used to prevent corrosion between opposing metals.

Preventing Electrolysis of Iron in Concrete (82343). W. A. Del Mar and D. C. Woodbury. Ills. 1200 w. *Elec Wld*—Nov. 10, 1917. Research indicates that anode corrosion may be decreased by coating metal with a porous film of paint.

Electrolytes

The Role of Complex Salts as Electrolytes in Plating and Refining Baths (88307). Reginald S. Dean and Ming Yi Chang. Ills. 2000 w. *Br Wld*—Aug., 1918. Theories and experimental study.

Electrometallurgy

Electric Furnace for Melting Alloys (88279). William H. Easton. Ills. 1200 w. *Elec Wld*—Aug. 17, 1918. Control apparatus must be carefully selected to provide for heavy fluctuations of load.

Melting Brass in a Rocking Electric Furnace (87290). H. W. Gillett and A. E. Rhoads. (Abstract.) Ills. 6500 w. *Fndry*—July, 1918. Development of great value to the nonferrous coating industry.

Electric Furnace for Forging and Annealing of Steel (86914). Wirt S. Scott. Ills. 3500 w. *Elec Rev, Chi*—June 8, 1918. Abstract from paper before Assn. of Iron & Steel Elec. Engrs. Development of modern furnaces for these purposes.

Electric Steel Castings (86979 N). R. F. Flinterman. 8 pp. *Am El Chem Soc*—April, 1918. Report of foundry experience.

Electrolytic Refining of Tin (86976 N). Edward F. Kern. 12 pp. *Am El Chem Soc*—April, 1918. Experiments to determine the best electrolyte, the best current density, and the best addition agent to use, with the object of saving the precious metals and getting pure tin.

The Electric Furnace for Annealing Treatment and Forging of Steel (87160 N). Wirt S. Scott, with discussion. Ills. 15 pp. *Assn I S E E*—April, 1918. Facts relating to a furnace developed by the Westinghouse Electric & Mfg. Co.

The Design and Operation of a Small Kjellin Furnace (85360 A). George H. Stanley and W. Buchanan. Ills. 4000 w. *Met & Chem Eng*—April 1, 1918. Serial. 1st part. Manufacture of electric steel for stamp-mill shoes and dies on the Witwatersrand, South Africa. Combined abstract of two papers.

The Properties of Electrolytic Copper—Modulus of Elasticity (83616 N). B. Welbourn. 700 w. *Instn E E, JI*—Dec., 1917. Results of investigation of the modulus which should be used for stranded conductors with Still's formula.

Electrical Machinery in Coke-Oven Works (83364 N). Alwyne Meade. Ills. 2500 w. *Elec'n*—Dec. 14, 1917. (Special No.) Types used, arrangement, and power required.

Grabs (83363 N). Ills. 1800 w. *Elec'n*—Dec. 14, 1917. (Special No.) Details of mechanical construction, describing the electric grab and system of control.

Electrometallurgy

Lessons from America in the Handling of Coal and Iron Ore (83354 N). G. H. Hutchinson. Ills. 4500 w. Elec'n—Dec. 14, 1917. (Special No.) Methods developed in the Lake Superior region.

Electric Carbon Tool Steel (83769 A). John A. Holden. 2000 w. Ir & Cl Trds Rev—Dec. 28, 1917. Deals with the Heroult type of electric furnace for the production of tool steel.

La Récupération Du Cuivre Et De L'Acide Dans Les Vieux Bains De Décapage (83934 B). 1600 w. L'Industrie Electrique—Nov. 25, 1917. Electrolytic process for recovering copper and acid from old cleaning baths.

Electro-Deposition of Zinc from Aqueous Solutions (84506 N). E. P. Mathewson, with discussion. 26 pp. Can Min Inst, Trans—1917. Bibliography and the process finally adopted.

Electrolytic Zinc Extraction at Trail, B. C. (84497 N). E. H. Hamilton. 500 w. Am El-Chem Soc, Trans—Oct., 1917. Composition of the ore and details of the work.

Electrolytic Zinc in Eastern Canada (84507 N). E. E. Watts. 2500 w. Can Min Inst, Trans—1917. Experimental work and conclusions.

The Future of Electrolytic Zinc (84496 N). Thomas French. 2200 w. Am El-Chem Soc, Trans—Oct., 1917. Comparative merits of the retort process and the electrolytic process of extracting zinc from its ores.

The Future of Electrolytic Zinc (82762 A). Thomas French. 2500 w. Met & Chem Eng—Dec. 1, 1917. Read before Am. Elec-Chem. Soc. Comparative metallurgical and economic future of the retort and electrolytic processes.

Annealing and Heat Treating of Steel and Melting of Non-Ferrous Metals in the Electric Furnace (82162 B). T. F. Bailey, with discussion. 6000 w. Cleve Eng Soc, Jl—Sept., 1917. Some of the uses to which electric furnaces have been applied.

The Electric Furnace as a Medium for Heating Non-Ferrous Metals (82453 F). 34 pp. A I Mt, Jl—Sept., 1917. Advantages by the use of the heat of electric energy in various metallurgical processes.

Electroplating

Effecting War Economies in the Plating Room (89227 B). E. P. Slater. 4000 w. Fndry—Oct., 1918. How waste may be eliminated and metals, acids and other materials conserved. (Special number.)

ELECTRO-CHEMISTRY**Industrial Chemistry**

What Is the Matter With My Nickel Solution? (86010). E. P. Later. 3000 w. Fndry—May, 1918. Difficulties of the plates considered and some remedies.

Electroplating Military Supplies (87995). 2000 w. Can Fndman—July, 1918. Recommendations.

Preparing Metal Parts for Electroplating—I. (87292). E. P. Later. 3300 w. Fndry—July, 1918. Serial, 1st part. Polishing wheels and polishing processes, etc.

Experiments with the Copper Cyanide Plating Bath (86980 N). 5 pp. Am El Chem Soc—April, 1918. Experiments to study the increase in copper concentration.

Wartime Production Methods (85273). Charles Pack. 2200 w. Brs Wld—March, 1918. Methods of producing metal parts; plating die castings, etc.

Brittleness Produced in Steel Springs by Electroplating (85830 N). O. P. Watts and C. L. Fleckenstein. 800 w. Am El Chem Soc—April-May, 1918. Tests on watch springs to determine cause of brittleness.

The Electrolytic Behavior of Manganese in Sulphate Solutions (85833 N). G. D. van Arsdale and C. G. Maier. 3000 w. Am El-Chem Soc—April-May, 1918. Study of current efficiencies, voltages and condition affecting the nature of deposits.

Addition Agents in Cyanide Solutions (82572). Joseph Haas, Jr. 1500 w. Brs Wld—Nov., 1917. Explains uses to which platers may put sodium potassium, tartrate or Rochelle salt, and sodium citrate to enable them to get uniform deposits from solutions of copper, brass and zinc.

Silver Peroxide and the Valence of Silver (82573). H. C. P. Weber. Ills. 1800 w. Brs Wld—Nov., 1917. Serial, 1st part. Investigations and results.

Ferro-Alloys

The Manufacture of Ferro-Alloys in the Electric Furnace (88211 D). Robert M. Keeney. 52 pp. A I M E, Bul—Aug., 1918. Metallurgical side of the manufacture.

Methods for the Commercial Analysis of Ferro-Silicon (85829 N). Earl M. Anger. 2500 w. Am El-Chem Soc—April-May, 1918. Personal notes and experiences in the commercial analysis of electric-furnace ferro-alloys.

Galvano Work

Copper Galvano from Gutta Percha (83779). Joseph Haas, Jr. Ills. 1800 w. Brs Wld—Jan., 1918. Details.

Industrial Chemistry

Advance in Industrial Organic Chemistry Since the Beginning of the War

Muscle Shoals

(89319 A). Samuel P. Sadtler. 6000 w. Chem & Met Eng—Oct. 1, 1918. Review of expansion in America; outlook for the future encouraging.

Organic Synthesis and the du Pont Company (89322 A). C. L. Reese and C. M. Stine. 2500 w. Chem & Met Eng—Oct. 1, 1918. Evolution and growth of a varied organic chemical industry.

The Electrochemical Industries at Shawinigan Falls (89320 A). Henry C. Randall. Ills. 3000 w. Chem & Met Eng—Oct. 1, 1918. Development of over 300,000 h.p. and of varied industries.

Muscle Shoals

The South's Greatest Offer to Electrochemistry—Muscle Shoals (85904). Ills. 1500 w. Mfrs' Rec—April 25, 1918. The benefits to be derived from the development of this water power. Amount now available.

Nickel Baths

The Preparation and Use of Rapid Nickel Baths (83411). E. P. Later. 3500 w. Fndry—Jan., 1918. Use of higher current densities. etc.

Nitrate Plants

Remarkable Record Made by Southern at Sheffield, Ala. (87934). Ills. 1000 w. Ry Age—Aug. 2, 1918. Location of 12 government nitrate plants causes the population to treble in ten months.

Over \$150,000,000 to Be Expended in Muscle Shoals District for Four Nitrate Plants and Dams (85902). Thomas F. Logan. 3000 w. Mfrs' Rec—April 25, 1918. Development of an enormous water power in the Tennessee River and the erection of nitrate plants.

Nitrates

Nitrate Plants at Muscle Shoals Under Construction by the Government (85551). David Holt. Ills. 1500 w. Mfrs' Rec—April 11, 1918. Plant for making explosives nitrates.

Nitrogen

Direct and Indirect Methods of Nitrogen Fixation (89358 A). E. Kilburn Scott. 3500 w. Chem & Met Eng—Sept. 25, 1918. Comparison of operations involved.

Micro-Organisms in Plant Chemistry and Nitrogen Fixation (89323 A). Ellwood Hendrick. Ills. 2500 w. Chem & Met Eng—Oct. 1, 1918. Development and application of organizations useful to plant growth.

Nitrogen Fixation Furnaces (89456 N). E. Kilburn Scott. Ills. 32 pp. Am El Chem Soc—Oct., 1918. Reviews and compares types of furnaces, and describes in detail the Kilburn Scott three-phase furnace.

ELECTRO-CHEMISTRY**Silver Deposit**

A La Conquête De L'Azote Atmosphérique (89066 B). H. M. Nagant. 12000 w. Rev Trimestrielle Canadienne—Aug., 1918. Sources and applications of nitrogen; its extraction from the atmosphere.

Electric Power for Nitrogen Fixation (87683 D). E. Kilburn Scott. 14 pp. A I E E, Pro—July, 1918. Explains the results of the arc flame process for making nitric acid.

How Do the Warring Nations Obtain Their Nitrogen Supply? (82222 A). S. Nauckhoff. Ills. 7800 w. Met & Chem Eng—Nov. 1, 1917. Article, translated from the Swedish, giving valuable information.

The Fixation of Atmospheric Nitrogen (82131 A). 1800 w. Elec Rev—Oct. 12, 1917. Serial, 1st part. The sources, fixation and oxidization processes, etc.

Work of the British Nitrogen Products Committee (83599 A). 4500 w. Met & Chem Eng—Jan. 15, 1918. Preliminary report of plans under way for cyanamide, ammonia, oxidation, and experimental synthetic ammonia plants.

The Nitrogen Problem (83912). 1200 w. Nature—Dec. 6, 1917. Present status and outlook for the future among the allied nations.

Organic Waste

Methods for Recovery of Useful Products (89073). 2100 w. Times Engng Supp—Aug., 1918. Various processes for recovery of fats, grease, etc., from garbage and offal.

Plating

Plating of Die Castings (84543). Joseph Haas, Jr. 2200 w. Brs Wld—Feb., 1918. Solutions tried out and results given.

Potentials

The Sign of Potentials (89454 A). Oliver P. Watts. 7 pp. Am El Chem Soc—Oct., 1918. Historical retrospect concerning the usage of electrochemists in designating the signs of potentials, and plea made for continuing the present conventions.

Rectifiers

Mercury Rectifiers for Battery Charging (87377 A). S. E. Wallace. 1500 w. Tel Engr—July, 1918. Describes an exchange unit.

Rossi, A. J.

Presentation of Perkin Medal to Auguste J. Rossi (84069 A). Ills. 7000 w. Met & Chem Eng—Feb. 1, 1918. Account of meeting at Chemists' Club, N. Y., with full text of addresses.

Silver Deposit

Process of Depositing Silver on Glass and China (87027). Howard

Silver Sulphide

Pearsall. 1800 w. Brs Wld—June, 1918. Information and formulae.

Silver Sulphide

Some Electrical Properties of Silver Sulphide (87558 A). George W. Vinal. Ills. 9 pp. U S Bur Stds—June 24, 1918. Results of investigations showing peculiar electrical behavior.

Steam

See same heading under Power Applications.

Storage Battery

Lead Type Storage Battery (87669 C). H. M. Beck. 12 pp. Ry Sig Assn, JI—June, 1918. Proper methods of handling batteries in railroad service.

Storage Batteries

Electric Storage Batteries (86653). Ills. 1800 w. Pwr Pt Eng—June 1, 1918. Serial, 1st part. Their construction, theory of operation, care, installation, and application.

See also same heading under Marine and Naval Engineering.

The Calculation of Storage Battery Capacities (85835 N). C. W. Hazlett. 2200 w. Am El-Chem Soc—April-May, 1918. New conditions imposed by the use of storage batteries for starting, lighting and ignition of automobiles. Development of alignment chart and circular slide rule for calculating capacities.

ELECTRO-PHYSICS**Electrodes****Thermoelectric Cell**

A Thermoelectric Standard Cell (84-379 D). C. A. Moxie. Ills. 8 pp. A I E E, Pro—Feb., 1918. Considers a means of obtaining a secondary standard of e. m. f. by utilizing the e. m. f. of a thermocouple.

Water Power

Water Power—Our Electrochemical Salvation (84172 A). C. A. Winder. Ills. 2500 w. Gen Elec Rev—Feb., 1918. Claims that water of Niagara Falls could be largely diverted for power purposes without detracting from the beauty of this cataract.

Water Power Legislation (84494 N). Map. 4500 w. Am El-Chem Soc, Trans—May, 1917. Presents needs of electrochemical industries.

Zinc

La Métallurgie Électrothermique Du Zinc (80080 B). J. Escard. Ills. 4000 w. Génie Civil—Aug. 17, 1918. Serial, 1st part. Zinc smelting in the electric furnace. Advantages.

Zinc Electrode

The Sign of the Zinc Electrode (85834 N). Wilder D. Bancroft. 2000 w. Am El-Chem Soc—April-May, 1918.

ELECTRO-PHYSICS**Alloys**

Thermo-Electromotive Force of Some Alloys (86975 N). M. A. Hunter and J. W. Bacon. 13 pp. Am El Chem Soc—April, 1918. A study at different temperatures.

Arc Discharges

Pluimontlading (82652 B). A. Vosmaer. Ills. 3900 w. Ingenieur—Oct. 6, 1917. A study of flaming and brush discharges under different conditions.

Dielectrics

The Characteristics of Dielectrics (85753). Chester Arthur Butman. 3000 w. Elec Wld—April 20, 1918. Interesting experimental facts.

Electrical Resistance

On the Rate of Change at 100° C. and at Ordinary Temperatures in the Electrical Resistance of Hardened Steel (89540 N). E. D. Campbell. 6 pp. Ir & St Inst—Sept., 1918. Quantitative data on the rate at which the electrical resistivity changes, indicating the influence of temperature.

Electrical Sensitivity

Photoelectric Sensitivity of Bismuthinite and Various Other Substances

(87159). W. W. Coblentz. 15 pp. U S Bur Stds, Sci paper 322—June 14, 1918. Summarizes results of an examination of various substances.

Electromagnetic Theory

Some Applications of Electromagnetic Theory to Matter (85763 D). Albert C. Crehore. 33 pp. A I E E, Pro—April, 1918. A study of this theory and its applications.

Electromagnets

The Stroke of an Alternating-Current Electromagnet (88381 A). A. Thomaén. Abstract of an article in *Electro. Zeit.* 1000 w. Elec'n—July 26, 1918. Conditions for an a. c. magnet.

Solenoids and Electromagnets (85978 A). Charles A. Clark. Ills. 2500 w. Machy—May, 1918. Principles, proportions, and applications in various kinds of machines.

Electrodes

Processes Within the Electrode Which Accompany the Discharge of Hydrogen and Oxygen (89451 N). Donald P. Smith. 9 pp. Am El Chem Soc—Oct., 1918. Measurements of the changes in electrical resistivity and in

Electrons

length by using electrodes of palladium, platinum, tantalum and iron.

Electrons

The Electron Theory (83882 B). William Albert Noyes. Ills. 16 pp. Fkn Inst, J1—Jan., 1918. Development of this theory.

Electrostatics

A Graphical Method for the Construction of Electrostatic Fields (83885 B). Sylvan J. Crooker. 700 w. Fkn Inst, J1—Jan., 1918. Method explained.

Filter Presses

Washing in Filter Presses (86300 A). D. R. Sperry. Ills. 1500 w. Met & Chem Eng—May 15, 1918. Considers in detail the construction and operation of filter presses for various industrial uses. Fourth part.

Frequency

Theory of the Static Frequency-Doubler (88377 A). M. Osnos. 1000 w. Elec'n—July 19, 1918. Abstract of an article in Elektro. Zeit. Mathematical.

Harmonics

Higher Harmonics in Polyphase Electric Systems (88379 A). V. Karapetoff. Abstract of paper before Am. Assn. for Adv. Sci. 1500 w. Elec'n—July 19, 1918. Higher harmonics in a symmetrical m -phase system are considered for both the star and the mesh connection.

Hysteresis

The Suppression of Hysteresis in Iron-carbon Alloys by a Longitudinal Alternating Magnetic Field (84177 A). C. W. Waggoner and H. M. Freeman. 2000 w. Gen Elec Rev—Feb., 1918. Remarkable experiments on the disappearance of hysteresis.

Note Sur Les Pertes Dans Les Toles De Fer Aux Fréquences Élevées (86451 D). M. Latour. 2700 w. Bul Soc Internationale des Electriciens—Mar., 1918. Losses in iron plates at high frequencies: hysteresis and Foucault currents.

Inductance

Self-Inductance of Long Reactance Coils (84213). H. B. Dwight. 1200 w. Elec Wld—Feb. 9, 1918. Develops formula for computing value, with two examples to illustrate application.

Induktion und Kapazität von Leitungen (84587 B). J. Fischer-Hinnen. Ills. 10,000 w. Bul-Schweiz. Elektrotechnischer Verein—Dec., 1917. Induction and capacity of conductors. Mathematical.

The Inductance of Tubular Conductors (84205). H. B. Dwight. Ills. 500 w. Elec Rev, Chi—Feb. 9, 1918. Derives a fairly simple formula for inductance of circuits using tubular conductors.

ELECTRO-PHYSICS**Magnetism****Induction Coils**

The Capacity—Potential Curves of an Induction Coil (89201 A). E. Taylor Jones. 2500 w. Elec'n—Aug. 30, 1918. Serial, 1st part. Experimental study.

Insulation

See same heading under Transmission and Distribution.

Ions

On the Nature of the Ordinary Gaseous Ion (82980 B). Leonard B. Loeb. 30 pp. Fkn Inst, J1—Dec., 1917. A study of the "small ion" theory.

Light

Ensayo de determinacion del equivalente mecánico de la luz (85104 A). P. P. De Aguiar. 6800 w. Rev Soc Cubana De Ingenieros—Feb., 1918. A research to determine the mechanical equivalent of light.

Lightning

Lightning Protection (82743). Terrell Croft. Ills. 2500 w. Pr Pt Eng—Dec. 1, 1917. Serial, 1st part. Types of apparatus employed and their principle of operation.

Loadstones

Galileo and Magnetism: A Study in Loadstones (86344 N). J. J. Fahie. Ills. 2500 w. Instn E E, J1—April, 1918. Reviews Galileo's early researches in magnetism.

Magnetic Circuit

The Magnetic Circuit (82479). Terrell Croft. Ills. 2000 w. Elec Rev, Chi—Nov. 17, 1917. Serial, 1st part. First of a series of five articles giving a simple explanation of the phenomena and laws.

Magnetic Flux

Magnetic Flux Distribution in Annular Steel Laminæ (82949 D). A. E. Kennelly and P. L. Alger. Ills. 18 pp. A I E E, Pro—Dec., 1917. Distribution of alternating magnetic flux density in ring laminæ is studied experimentally.

Magnetic Pull

Magnetic Pull in Electric Machines (88905 D). E. Rosenberg. 45 pp. A I E E, Pro—Sept., 1918. Investigates the occurrence and the effect of unbalanced magnetic pull in electric machines and derives formulas for use of the designer.

Critical Review of the Bibliography on Unbalanced Magnetic Pull in Dynamo-Electric Machines (88904 D). Alexander Gray and J. G. Pertsch. 1200 w. A I E E, Pro—Sept., 1918.

Magnetic Susceptibility

See same heading under Measurement.

Magnetism

Terrestrial Magnetism in Relation to Mine Surveying (88881 N). C. Chree,

Magnetism

with discussion. 41 pp. Instrn Min Engrs, Trans—Aug.-Sept., 1918. Account of work in progress in terrestrial magnetism, and information being accumulated.

Magnetism

The Influence of Magnetism on Light (83886 A). L. R. Ingersoll, 1500 w. Sci M—Jan., 1918. Results of investigations.

Mechanical Equivalent

L'Equivalent Mécanique De La Lumière (86456 B). A. Boutaric. 2500 w. L'Industrie Electrique—Apr. 10, 1918. Mechanical equivalent of light and calculation of radiation from different sources.

Metallic Structure

Structure of Metals (87726). 900 w. Times Engng Supp—June, 1918. Examination of steel and other metals by X-rays from a new type of tube.

Meteorology

Meteorology: Thunderstorms (84716). W. G. Duffield. Ills. 1800 w. A A Wkly—March 4, 1918. Explains forms which lightning may take, and the use of lightning conductors, production of ozone, etc.

Oscillograms

Harmonic Analysis of Oscillograms (87296 A). G. H. Cole. Ills. 3300 w. Elec JI—July, 1918. Use of the harmonic analyzer and the polar oscillograph attachments.

Potentials

See under Electro-chemistry.

Radiations

See same heading under Measurement.

Radio Active Salts

Les Sels Lumineux Radifères (85117 B). F. Colomer. 1200 w. La Nature—Feb. 9, 1918. Rare earths and other radioactive substances.

Radio-Activity

See Philippine Waters, under CIVIL ENGINEERING, Water Supply.

Radioactivity

Radium and Radio-Activity (87774 A). Charles H. Viol. 9500 w. E Cb Phila, JI—July, 1918. Reviews the discovery and development, giving radio elements known, and related information.

The Constancy of the Radioactivity of Certain Philippine Waters (84889 N). George W. Heise. 600 w. Phil JI Sci—Nov., 1918. Data indicating remarkable constancy for long periods.

The Radioactivity of the Waters of the Mountainous Region of Northern Luzon (84888 N). George W. Heise. Plate & Ills. 2500 w. Phil JI Sci—Nov., 1917. Study and tests showing the phenomenon

ELECTRO-PHYSICS**Silver Sulphide**

is probably most common among waters of volcanic origin.

See same heading under ILLUMINATION.

Motor Control

See same heading under Illumination.

Radium

An Apparatus for the Separation of Radium Emanation and Its Determination Electroscopically (89452 N). J. E. Underwood and Herman Schlundt. Ills. 6 pp. Am El Chem Soc—Oct., 1918. Describes apparatus and method of determining radium in various ores and concentrates.

Notes on the Heterogeneous Equilibrium of Hydrogen and Oxygen Mixed with Radium Emanation (89453 N). S. C. Lind. 9 pp. Am El Chem Soc—Oct., 1918. Discussion of the catalytic effect of radium emanation on causing hydrogen and oxygen to combine.

The Bisulfate Method of Determining Radium (87281 B). Howard H. Barker. Ills. 2500 w. JI Ind & Eng Chem—July, 1918. Experiments and results.

Reactance Coils

Repulsion and Mutual Inductance of Reactance Coils with the Same Axis (86019 A). H. B. Dwight. 1000 w. Elec JI—May, 1918. Gives formulæ and results plotted in curves.

Reactors

Installation and Care of Reactors (86067). M. E. Skinner. 3000 w. Elec Wld—May 4, 1918. Factors of importance in their operation.

Resistances

Graphical Methods for Resistances in Parallel (89041 A). W. T. MacCall. 1200 w. Elec Rev—Sept. 6, 1918. Explains several constructions.

Do Equiatomic Solutions in Iron Possess Equal Resistances? (82965 N). E. D. Campbell, with discussion. 4000 w. Taraday Soc, Trans—June, 1917. Experimental work obtain a more satisfactory hypothesis than is offered by Benedict's law.

Experimental Test of the Wiedemann-Franz Ratio Through a Change of State (82456 B). Edwin F. Northrup and Frank R. Pratt. Ills. 13 pp. Fkn Inst, JI—Nov., 1917. Investigation to hold approximately true for two typical metals which change in resistance in opposite directions when carried from the solid to the molten state.

Silver Sulphide

Some Electrical Properties of Silver Sulphide (83654). George W. Vinal. Ills. 9 pp. U S Bur Stnds, Sci paper 310—Nov. 24, 1917. Investigations and results.

GENERATING STATIONS

Central Stations

Skin Effect

Skin Effect in Tubular and Flat Conductors (88214 D). H. B. Dwight. 20 pp. A I E E, Pro—Aug., 1918. Method for calculating the skin effect resistance ratio of a tube, and also of a thin strap.

Solenoids

Short-Circuit Windings in Direct-Current Solenoids (87967 A). O. R. Schurig. Ills. 1400 w. Gen Elec Rev—Aug., 1918. Useful applications

Thermionic Valve

The Evolution of the Thermionic Valve (86345 N). R. L. Smith-Rose. Ills. 9000 w. Instn E E, JI—April, 1918. Explains the term and traces the development and uses.

Tungsten

Emissivity of Straight and Helical Filaments of Tungsten (86030 A). W. W. Coblenz. Ills. 17 pp. U S Bur Stds—April 6, 1918. Data on the radiation from the inside and outside of the turn of a helically wound tungsten filament in an atmosphere of nitrogen.

Ultraviolet-Rays

Ultraviolet Energy and Its Use (84720 A). M. Luckiesh. 4000 w. Met & Chem Eng—March 1, 1918. Fundamental principles of ultraviolet light, with discussion of the various sources.

Vacuum Tubes

Le Tube A Vide Et Ses Applications (82697 B). R. Raymond. 1800 w. Industrie Electrique—Nov. 10, 1917. Recent developments and applications of various designs.

Wave-Lengths

Wave-Length Measurements in Spectra from 5600 to 9600 A (87560 A). W. F. Meggers. Ills. 24 pp. U S Bur Stds—June 24, 1918. Photographic investigation of the spectra of some of the elements in the region of longer wave lengths. Arc spectra of 20 of the chemical elements were photographed.

Wave Motion

Electric Waves (84472 B). W. S. Franklin and Barry McNutt. Ills. 34 pp. West Soc Engrs, JI—Nov., 1917. Discussion of the simplest aspects of the dynamics of wave motion

X-Rays

A New Radiator Type of Hot-cathode Roentgen-ray Tube (83610 A). W. D. Coolidge. Ills. 2500 w. Gen Elec Rev—Jan., 1918. Describes a tube developed for military use.

A Portable Roentgen-Ray Generating Outfit (83620 A). W. D. Coolidge and C. N. Moore. Ills. 4000 w. Gen Elec Rev—Jan., 1918. Outfit for military service in the field.

GENERATING STATIONS

Army Requirements

Electrical Developments for American Army (89003). R. K. Tomlin, Jr. Ills. 3000 w. Elec Wld—Sept. 21, 1918. The requirements of the American Expeditionary Forces and what is being done to meet them.

Brown Coal

Electrical Energy from Brown Coal (83372 N). Map. 1000 w. Comwh Engr—Nov. 1, 1917. Investigations made for the Victorian government in regard to the commercial utilization of brown coal.

Business Methods

War's Influence on Central-Station Selling (86790). 2500 w. Elec Wld—June 8, 1918. Changes in business methods forced by prohibitive cost of extensions.

Calgary

The Central Station at Calgary (84204). James F. McCall. Ills. 2000 w. Elec Rev, Chi—Feb. 9, 1918. Details of a municipal electric plant in Alberta, Can.

Central Plant

Power Plant of the St. Joseph Lead Co. (82148). E. L. Broome. Ills. 1600

w. Power—Oct. 30, 1917. New central plant serving several mining properties in southeastern Missouri.

Central Stations

New Wood-Burning Station of Northwestern Electric Company (89513). Ills. 1200 w. Elec Rev, Chi—Oct. 12, 1918. Details of construction and equipment of a plant nearing completion at Portland, Ore.

The Electricity Supply of Archangel (89525 A). Ills. 2500 w. Elec Rev—Sept. 27, 1918. Description from *Elektrichestvo*.

War's Effect on Central-Station Policy (89484). Philip Cabot. 2200 w. Elec Wld—Oct. 12, 1918. Address before New England Sec. of Natl. Elec. Lgt. Assn. Opportunities for large scale development, and forecast of government ownership.

Central Station vs. Isolated Plant (86674). W. H. Wakeman. 2000 w. Natl Engr—June, 1918. Cost not always the deciding factor.

The Central Station and Illumination (86762 A). H. E. Mahan. Ills. 3000 w. Gen Elec Rev—June, 1918. Treated

Chicago

GENERATING STATIONS

Electric Power

from the standpoint of central station policy and rendering expert service to the customer.

Operating Results in Central Stations (85389). 2000 w. Natl Engr—April, 1918. Shows how varying operating conditions affect the cost factors.

A Standardized Method of Unit Construction for Central Stations (84815). Ills. 2000 w. Elec Rev, Chi—March 9, 1918. Sectionalized construction employed by the commonwealth Edison Co.

New Central Station of Union Gas & Electric Company at Cincinnati (83853). Ills. 4000 w. Elec Rev, Chi—Jan. 26, 1918. Interesting features of a large plant nearing completion.

The Central Station Industry in the War Period (83514). T. Commerford Martin. 1500 w. Elec Rev, Chi—Jan. 5, 1918. Gross earnings total \$500,000,000; coal core-makers necessary rate increase.

Chicago

New Generating Equipment at Chicago (85659). Ills. 1600 w. Elec Rev, Chi—April 13, 1918. Two new 35000-kilowatt turbogenerators installed by Commonwealth Edison Co.

Cincinnati

Cincinnati's New Generating Station (88584). Ills. & Plate. 4000 w. Power—Sept. 3, 1918. Big bulk station with installed capacity of 50,000 kw. in two units.

Cincinnati's New 100,000-Kilowatt Power Station (88818). Ills. 1800 w. Elec Rev, Chi—Sept. 14, 1918. Serial, 1st part. Details of layout and mechanical equipment.

Cincinnati's New Source of Electric Energy Supply (85357). Ills. 2200 w. Pwr Pt Eng—April, 1918. Features of West End Power Station.

Coal Conservation

Coal Conservation Suggestions for the Central Station Industry (89629). P. B. Noyes. 1500 w. Elec Rev, Chi—Oct. 19, 1918. Fuel administration asks Central Stations to use coal more efficiently and reduce needless energy.

Coal Saving

Bonus Plan Reduces Coal Consumption at Manila (84313). B. H. Blaisdell. 4000 w. Elec Ry J1—Feb. 16, 1918. Dividing saving effected with power plant employees gives men increase in wages of about \$700 per month.

Coal Supply

Coal Supply Made Sure by Buying Mines (84798). 2200 w. Elec Wld—March 9, 1918. Reasons why the Commonwealth Edison Co. began fourteen years ago to buy coal mines and lands.

Coal Storage

Coal Storage Systems for Power Plants (88803). Ills. 1700 w. Pwr Pt Eng—Sept. 15, 1918. General methods of storing and reclaiming coal.

Columbus

Walnut Station of Columbus Railway, Power & Light Company (84459). Ills. 4500 w. Elec Rev, Chi—Feb. 23, 1918. New steam-electric generating station.

Combined Plant

Features of Steam Plant Supplementing Water Power (85754). Ills. 800 w. Elec Wld—April 20, 1918. Station at Hamilton, Canada, designed for 75000-kva. ultimate rating.

Conservation

War Conservation of Power and Light (87179). 2500 w. Elec Rev, Chi—June 22, 1918. Programme of U. S. Fuel Administration affecting central station companies.

Contracts

Engineering Advice in Making Electric Power Contracts (82636 A). A. Langstaff Johnston, Jr. 1200 w. Ind Man—Dec., 1917. Reviews the varieties of rates and unsatisfactory results.

Coöperation

Coöperation of Public-Service and Isolated Plants (87573). Ira N. Evans. 1800 w. Power—July 16, 1918. Reply to Mr. Alt's criticism of an earlier article.

Compulsory Co-operation of Central Station and Isolated Plant (86923). S. R. Sague. 3000 w. Power—June 18, 1918. Advisability of coöperation to avoid duplication of distributing systems and prevent waste of coal.

Coöperation of Public Service and Isolated Plants (85782). Ira N. Evans. 2500 w. Power—April 23, 1918. Coöperation will bring mutual profit, conserve coal and reduce investment for equipment.

Earth Connections

Earthing Power-Station Equipment (89028). P. H. Adams. Ills. 2500 w. Power—Sept. 24, 1918. Discusses the earth connections and reasons for making them.

Electrical Industry

A Recent "Union Electric" Development (82418 A). John Hunter. 1500 w. E Cb St L, J1—Sept.-Oct., 1917. Outlines main features of development of the Ashley Street Generating Station,

Electric Power

Electric Power Supply in the Future (87353 A). 5000 w. Engr—June 7, 1918. From report of committee appointed by the Board of Trade, to consider steps to insure an adequate supply for all consumers.

Equipment**GENERATING STATIONS****Hydro-Electric**

Scottish Local Section: Chairman's Address (83614 N). Archibald Page. 5000 w. Instn E E, J1—Dec., 1917. Supply of electric power in the United Kingdom; what has been accomplished in Scotland; and future possibilities.

Electric Service

Effects of War Conditions on Cost and Quality of Electric Service (83342 D). Lynn S. Goodman and William B. Jackson. 16 pp. A I E E, Pro—Jan., 1918. Considers the effects of war conditions as they apply to the electric light and power service of the country.

Spirit of War in the Central West (83479). Ills. 2500 w. Elec Wld—Jan. 5, 1918. Electric utilities mobilizing resources to meet service.

The Modern Conception of Electric Service (82646 B). F. S. Dewey. 5000 w. Iowa Eng Soc, Pro—Feb., 1917. Functions and extent of service, benefits, etc.

Why Electric Service Must Be Maintained (84814). F. H. Bernhard. Ills. 2500 w. Elec Rev, Chi—March 9, 1918. Power supply an essential element in winning the war.

Equipment

Methods of Drying Out Flooded Plant Equipment (83511). Norman L. Rea. Ills. 2000 w. Power—Jan. 8, 1918. Good ways for drying out electrical equipment after a plant has been flooded.

Fuel

Power Plants and the Fuel Administration Situation (87286). A. P. Connor. Maps. 3000 w. Pwr Pt Eng—July 1, 1918. Information on the coal, power, and heating situation and regulations of the fuel administration during war-time.

Economy in the Use of Fuel in Power Stations (85815 B). Charles H. Parker, with discussion. Ills. 26 pp. Bos Soc C E, J1—April, 1918. Losses and methods of correcting them; mechanical stokers and their advantages; types; other instruments; suggestions, etc.

Fuel Conservation

Electrical Interconnections to Conserve Fuel (83477). Maps. 1500 w. Elec Wld—Jan. 5, 1918. States of New York and California show results.

Great Britain

Proposed Interconnection of Electric Power Supply in Great Britain (84206). 4500 w. Elec Rev, Chi—Feb. 9, 1918. Interim report of Coal Conservation Subcommittee dealing with power generation and transmission.

The Great Lake Hydro-Electric Development of Tasmania (88580). Ludwig W. Schmidt. Ills. 1800 w. Power—Sept. 3, 1918. Interesting features of a 100,000-hp. development undertaken by private enterprise and completed with the aid of the government of Tasmania.

Hydro-Electric

Hydro-Electric Power in Canterbury, New Zealand (88894 A). Ills. 2500 w. Elec Rev—Aug. 30, 1918. Particulars regarding the development of power from Lake Coleridge.

Hydro-Electric Development at Rochester (89181). Ills. 1000 w. Pwr Pt Eng—Oct. 1, 1918. Relieving peak load on steam plant; unusual system of generator protection.

New Hydroelectric Plant of Montana Power Company (89205). W. A. Scott. Ills. 2200 w. Elec Rev, Chi—Sept. 28, 1918. Serial, 1st part. The Holter project, recently completed. Details of hydraulic equipment.

Aménagement De Chutes D'Eau Dans Les Pyrénées (89704 B). Ills. 3400 w. Génie Civil—Sept. 21, 1918. Serial, 1st part. Hydro-electric installations in the Pyrenees district for supplying energy to the Southern Railway system in France.

Construction Problems at Copco Plant (87986). Ills. 1000 w. Elec Wld—Aug. 3, 1918. Hydroelectric installation on the Klamath River, in Oregon. Difficulties due to extensive changes made after the work was started.

Interesting Small-Capacity Low-Head Hydroelectric Development (88035). Ills. 1800 w. Elec Rev, Chi—Aug. 3, 1918. Geddes plant, on Huron River, utilizing low-head water power.

Junction Development Power Plant (88297). Ills. 3000 w. Power—Aug. 20, 1918. Details of the largest hydro-electric plant in Michigan, connected with Grand Rapids by a 140,000-volt line.

Modern Development of Large Hydro-Electric Power Schemes (87796 A). C. Fred. Holmboe. Ills. 3500 w. Elec'n—June 21, 1918. Outlines the procedure that should be adopted, and gives details.

New Plant Added to Michigan System (88108). Ills. 3500 w. Elec Wld—Aug. 10, 1918. Junction development, the largest hydro-electric plant in Michigan, is model of simplicity. Connected with Grand Rapids by 140,000-volt line.

Chippawa-Queenston Power Development (87056). Ills. 5000 w. Can Engr—June 20, 1918. Development at Niagara, the largest hydro-electric power scheme ever undertaken.

Hydro-Electric

GENERATING STATIONS

Hydro-Electric

Electric Power for Mining in Yavapai County, Arizona (87068). P. R. Milnes. Ills. & Map. 1800 w. Eng & Min JI—June 22, 1918. Describes hydro-electric plant on Fossil Creek, distributing power from sub-stations at Jerome and Clarkdale.

The Pearson Hydro Electric Development in Catalogne, Spain (86615). Ch. Dantin, in *Le Genie Civil*. Ills. 2500 w. Eng & Con—May 29, 1918. General features of the development.

The Tasmanian Hydro-Electric Department (86870 A). Ills. & Map. 1500 w. Aust Min Stan—Apr. 25, 1918. The King River power scheme described.

Trebling the Capacity of a Hydro-Electric Plant During Operation (86616). Byron S. White. Ills. 2000 w. Eng News-Rec—May 30, 1918. Trenton Falls development in Adirondacks.

Electric Power Back of the New Italian Lines (82338). C. A. Tupper. Ills. 3000 w. Elec Rev, Chi—Nov. 10, 1917. Plants for furnishing hydro-electric power for Italian arsenals.

European Hydro-Electric Installations (82335). Sydney F. Walker. 4000 w. Cl Age—Nov. 10, 1917. Opportunities for the development of water power.

Hydroelectric Power for Fixation of Nitrogen—A War Asset (82609). 2500 w. Elec Rev, Chi—Nov. 24, 1917. Accomplished on a large scale in Norway. Electrical process used.

Laurentide Power Developed After War's Interruption (82588). Map & Ills. 2000 w. Eng News-Rec—Nov. 22, 1917. Interesting features of the development.

Automatic Power Plant at Cedar Rapids (82769). Ills. 3500 w. Elec Ry JI—Dec. 1, 1917. Development in Iowa. 2000-kw., low-head generating plant operates in parallel with 1900-kw. steam station.

Electrochemical Development at Shawinigan (83186). Ills. 1400 w. Elec Rev, Chi—Dec. 22, 1917. Hydro-electric development opens vast electrochemical industry in this Canadian city.

Features of an Automatic Hydroelectric Plant (82754). Ills. 3300 w. Elec Wld—Dec. 1, 1917. Details of construction and arrangements for control.

The Automatic Hydro-Electric Generating Station of the Iowa Railway and Light Company (82819 A). L. B. Bonnett. Ills. 2200 w. Gen Elec Rev—Dec., 1917. Details of an automatic station supplementing a large steam-electric station.

Helping France to Help Herself (83687). Alexander C. Clogher and Victor F. Hammel. Ills. 2000 w. Elec Wld—Jan. 19, 1918. Urges the development of hydro-electric power to supplant coal supply.

Notes on Water Supplies as Sources of Power (83699). Cecil A. Roberts. 2200 w. Can Engr—Jan. 17, 1918. From paper before Instn of Water Engrs. Its important place in future activities of the world and the problems to be solved.

Some Commercial Aspects of Hydro-electric Development (83855). Calvert Townley. 3000 w. Elec Rev, Chi—Jan. 26, 1918. Statement of present conditions; a comparison of steam-electric and hydroelectric plants.

Hydro-Electric Development (84193). Calvert Townley. 3500 w. Can Engr—Feb. 7, 1918. Presented to the Water Power Committee of the U. S. Chamber of Commerce. On estimated undeveloped water power and its industrial value.

Impianto Idroelettrico Del Corfino (84603 B). A. Omodeo. Ills. 3600 w. Industria—Jan. 15, 1918. Hydro-electric development on Corfino River in Italy. Interesting features.

Hydro-Electric Power in Northern and Central California (84858). Map. 1500 w. West Eng—March, 1918. Interconnection between systems and the benefits.

De Waterkrachtindustrie in Scandinavië en over het waterkrachtvraagstuk in Nederlandsch-Indië (85107 B). A. Groot-hoff. Ills. 16,000 w., with discussion. Ingenieur—Jan. 12, 1916. Water power developments in Scandinavia and their bearing upon the Dutch East-Indies.

The Hydroelectric Situation Up to Date (84757 A). Calvert Townley. 2000 w. Elec JI—March, 1918. Discusses economic and legislative conditions.

Certain Hydro-Electric Power Possibilities in the Provinces of Quebec and Ontario, Canada (85831 N). Louis Simpson. 800 w. Am El-Chem Soc—April-May, 1918. Possible developments of the Ottawa and the St. Lawrence rivers.

Technisch-economische studie van waterkrachten (85857 B). G. H. Van M. Broekman. 4600 w. Ingenieur—March 9, 1918. Technical and economic study of water power. Economic aspects of development in all parts of the world.

Hydro-Electric Power Development in Australia and New Zealand (85369). Ludwig Schmidt. 3000 w. Power—April 2, 1918. Account of present development, proposed extensions and new enterprises.

GENERATING STATIONS

New England

Industrial Plants

Modern Plant of Paris Medicine Co. (87284). Ills. 1200 w. Pwr Pt Eng—July 1, 1918. Boiler room economy the chief aim.

Interconnection

Interconnection of Plants in Massachusetts. Also, Typical Benefits from Plant Interconnection (84706). Map. 1500 w. Elec Wld—March 2, 1918. Economic movement of importance.

Trend of Public Utility Interconnection (84816). Maps. 2500 w. Elec Rev, Chi—March 9, 1918. Movement toward interconnected generating and transmission systems.

Interruptions

Preventing Interruption of Production (89264). Sydney Fisher. 3500 w. Elec Wld—Oct. 5, 1918. What can be done to assure uninterrupted maintenance.

Ireland

Electricity Supply in Dublin and the Surrounding Districts (84139 N). W. Tatlow, with discussion. 6500 w. Instn Elec Engrs, Jl—Jan., 1918. Urges the concentration of generating plant, and considers improvements and legislation needed.

Dublin Local Section: Chairman's Address (83610 N). O. T. O'Kelly Webber. 1200 w. Instn E E, Jl—Dec., 1917. The resources of Ireland and their development.

Isolated Plants

Isolated Plant for Foundry and Machine Shop (84272). Ills. 1000 w. Pwr Pt Eng—Feb. 15, 1918. New Chicago factory having a small but modern power plant with standard equipment.

Isolated Service for Economy (87540). Ills. 2200 w. Pwr Pt Eng—July 15, 1918. Plant of Burroughs Adding Machine Co.

The Forcible Shutting Down of Isolated Power Plants (85240). Percival R. Moses. 2000 w. Power—March 26, 1918. Account of events that led to the hearings before the N. Y. Public Service Commission on the advisability of substituting central-station service, to save coal.

Italy

Future Electric Development in Italy (88624 A). 1300 w. Ir & Cl Trds Rev—Aug. 9, 1918. From an article by E. Strachan Morgan in the *Anglo-Italian Rev.* Past accomplishments and future outlook.

Electrical Energy from the Volterra "Soffioni" (84677 A). Ills. 1000 w. Egner—Feb. 8, 1918. Account of methods to utilize the steam of hot springs for producing power.

Load Relief Map

Annual Load Relief Map, Peak Load and Load Factor Analysis (82946 D). William LeRoy Robertson. Ills. 7 pp. A I E E, Pro—Dec., 1917. Describes a device for visualizing the entire yearly load of central stations.

Loads

An Ideal Twenty-four-hour Load Now Awaiting Central Station Power (89439 A). S. G. Gassaway and W. G. Taylor. 2000 w. Gen Elec Rev—Oct., 1918. Electrification of the oil fields will give a large saving in oil.

Relation of Coal Situation to Central-Station Load (87240). J. R. Cravath. 1600 w. Elec Wld—June 29, 1918. Off-peak service with attractive rates is urged for isolated plant customers.

Improved Industrial Lighting Offers Timely Load (87042). F. H. Bernhard. 2000 w. Elec Rev, Chi—June 15, 1918. Intensive production calls for better lighting.

The Central Station and the Industrial Electric Heating Load (87041). Arthur F. Allsop. Ills. 3000 w. Elec Rev, Chi—June 15, 1918. Serial, 1st part. Shows this load to be worthy of development.

Loads

Industrial Load Characteristics (85480). J. E. Mellett. Curves. 1200 w. Elec Wld—April 6, 1918. A study of typical daily load curves.

Mine-Mouth Power

Bulk-Supply Generating Station at Mouth of Mine (84211). Ills. 2500 w. Elec Wld—Feb. 9, 1918. Serial, 1st part. Features of the Windsor (W. Va.) power plant operated jointly by two companies.

The Windsor Power Station (84217). Ills. 3500 w. Power—Feb. 12, 1918. Features of plant at coal mine in W. Va. to produce bulk energy for joint mine owners.

Municipal Plant

Water and Electric Current for Poplar Bluff (82116). Ills. 1500 w. Pr Pt Eng—Nov. 1, 1917. Missouri city installs electric generators driven by unaf-flow engines.

New Bedford

New 52,000 kw. Station of New Bedford Company (84461). Ills. 1500 w. Elec Wld—Feb. 23, 1918. Serial, 1st part. Engineering features of the largest steam-turbine plant in South Massachusetts.

New England

Water Powers of New England (83261 B). Henry I. Harriman. 13 pp. Bos Soc Civ Engrs, Jl—Dec., 1917. Hy-

Niagara Power

droelectric developments in their relation to industrial conditions.

Niagara Power

Niagara Power in War Industries (87663). 1800 w. Elec Wld—July 20, 1918. Plan to distribute hydroelectric energy to war industries.

Ohio

More Energy for Mansfield District (88800). Ills. 2500 w. Pwr Pt Eng—Sept. 15, 1918. New Melco, O., plant utilizes both natural gas and coal.

Operating Expenses

Analysis of 1,000-Kw. Plant's Revenue and Expense (82622). 2000 w. Elec Wld—Nov. 24, 1917. Marked effect of prevailing high prices.

Power

Economic Proportion of Hydro-electric and Steam Power (88906 D). Frank G. Baum. 1000 w. A I E E, Pro—Sept., 1918. A new method of determining what proportion of generation should be hydro-electric and what steam, from the standpoint of economics.

Power Control

Discussion on "The Control of Large Amounts of Power" (89104 N). 13 pp. Instn E E, JI—July, 1918. Paper by E. B. Wedmore is discussed.

Power Development

Smooth Rock Falls Power Development (84685). E. W. Neelands. Ills. 3000 w. Can Engr—Feb. 28, 1918. Plant completed in one year.

Power Factor

Effect of Power-Factor on Central Station Operation (88116). Will Brown. Ills. 2500 w. Elec Rev, Chi—Aug. 10, 1918. Good volt regulation and transmission efficiency can be obtained by installing synchronous motors.

Power Factor and the War (87242). Will Brown. Ills. 2000 w. Elec Wld—June 29, 1918. Conditions make it essential to obtain maximum use from equipment. One way is to improve power factor.

Getting the Maximum Out of Equipment (86667). Will Brown. 3000 w. Elec Wld—Oct. 26, 1918. Serial, 1st part. How to improve power factor to meet the needs of the approaching winter.

Power Factor and Its Improvement (86852 A). E. W. Dorey. 1800 w. Elec'n—May 24, 1918. Serial, 1st part. Causes of low power factor, and whether the cost of improvement should be borne by the consumer or by the supply.

Improving Power-Factor by Static Condenser (88532). Also editorial. Ills. 3000 w. Elec Rev, Chi—Aug. 31, 1918.

Power Generation

Combining Loads to Gain Economies of

GENERATING STATIONS**Power Supply**

Large Units and High Diversity Factor (84201). 2200 w. Elec Ry JI—Feb. 9, 1918. Serial, 1st part. Huge jointly owned steam generating plant at Windsor, W. Va.

See also Turbines, under MECHANICAL ENGINEERING, *Hydraulic Machinery*.

Power Plants

Joliet Plant of the Public Service Co. (84691). Ills. 3000 w. Pwr Pt Eng—March 1, 1918. Features indicating changes in modern practice.

Ninety-five Thousand Kilowatt Addition to Northwest Station (84850). Ills. 2500 w. Power—March 12, 1918. Details of installation of three additional turbo-generators of an aggregate capacity of 95,000 kw.

Steam-Electric Plant Dominion Power and Transmission Co., Hamilton, Ont. (84741). Ills. 6000 w. Pr House—Jan., 1918. Excellent design and arrangement.

Joliet Plant a Step Toward Higher Steam Pressures (83688). Ills. 1200 w. Elec Wld—Jan. 19, 1918. Serial, 1st part. Features of boilers, piping and economizers, with arrangements for handling coal and supplying feed water.

Power Plant Practice During 1917 (83516). I. L. Kentish-Rankin. Ills. 4500 w. Elec Rev, Chi—Jan. 5, 1918. Review of experiences due to shortage of coal and labor, and economies effected.

New High-Pressure Joliet Plant (83719). Ills. 3500 w. Power—Jan. 22, 1918. Interesting features of a new generating station in Illinois.

Power Plant Design

Plant Designed to Meet War-Time Conditions (89482). Ills. 2500 w. Elec Wld—Oct. 12, 1918. Arrangements for burning coal, oil and wood. Electrical features.

Arrangements to Avoid Operating Difficulties—I (89611). Ills. 1500 w. Elec Wld—Oct. 19, 1918. Serial, 1st part. Attention given in the new Dayton plant to handling coal economically and obtaining clean intake water.

Plant Arrangements and Costs of Construction (89665). Ills. 2500 w. Elec Wld—Oct. 26, 1918. Serial, 1st part. Features of latest station of Turners Falls Power & Electric Co.

Power Service

Central or Independent Power Service (85503). Frederick B. Kenney, with discussion. 3000 w. Power—April 9, 1918. Read before Providence Eng Soc. Reasons for development of this central electric light and power industry.

Power Supply

Electric Power Supply (82673). 3000 w. Times Engrg Supp—Oct. 26, 1917.

Rand

GENERATING STATIONS

Summer Load

The future of electric power supply in Great Britain. Technical details, interconnection, etc.

Rand

Electrical System of the Rand Power Companies, with Special Reference to Methods of Operation and Experience (85248 N). Bernard Price. 32 pp. S Af Inst Elec Engrs, Trans—Dec., 1917. Reply to discussion, taking up each question.

Rates

Attitude of Central Stations on Rates (88648). 2000 w. Elec Wld—Sept. 7, 1918. Economic changes in rate making policies and practice to be anticipated as result of war.

Cost Versus Value of Service in Rate Making—I (88534). John Bauer. 1500 w. Elec Wld—Aug. 31, 1918. Serial, 1st part. Discussion of fundamental factors to be considered in public utility system.

Reasonable Charge for Off-Peak Electric Current (88298). 1500 w. Power—Aug. 20, 1918. Opinion of Percival R. Moses of a reasonable rate for off-peak current furnished by the central station to the isolated plant.

Effect of Increased Costs on Central Station Rates (82337). 2500 w. Elec Rev, Chi—Nov. 10, 1917. Statistics. Effects of increased costs of fuel, labor and material.

Record Keeping for Isolated Power Plants (84637). Frederick C. Ruck. 4000 w. Natl Engr—March, 1918. Value of records. Reports of boiler tests, etc.

Rochester

New Station No. 5 of the Rochester Railway & Light Company (85190). P. B. Findley. Ills. 2000 w. Elec Rev, Chi—March 23, 1918. Hydro-electric station to carry load peaks of combined system.

Service Cost

Effects of War Conditions on Cost and Quality of Electric Service (83709). L. S. Goodman and W. B. Jackson, with discussion 7800 w. Elec Rev, Chi—Jan. 19, 1918. Analysis of conditions in electric light and power service and some of their remedies. From paper before A. I. E. E.

Small Plant

Unique Features of a Small Electric Generating Plant (84701). A. R. Zahorsky. Ills. 1500 w. Elec Rev, Chi—March 2, 1918. Combined water-power and oil-engine plant in Ozark Mts.

Steam Turbine Plant

New Bedford Company's 52000-Kw. Station (85580). Ills. 2500 w. Elec Wld—April 13, 1918. Engineering features of steam-turbine plant.

Substations

Construction of Outdoor Substation at Madero, Cal. (85479). S. J. Moore. Ills. 1200 w. Elec Wld—April 6, 1918. Preference given to suspension insulators and wood poles; provisions for maintaining service.

Automatically Remote-Controlled Synchronous - Motor - Generator Substation (88819). William Thomas Snyder. Ills. 800 w. Elec Rev, Chi—Sept. 14, 1918. Relative cost of automatic and manually-operated substation and mode of operating a station of 1000-kw. capacity.

Remote Controlled Sub-Station (88919 N). W. T. Snyder. Ills. 7 pp. Assn I S E E—Sept., 1918. Detailed description of a type, its operation and cost.

The Outdoor Substation in War Service (89004). E. B. Meyer. Ills. 1800 w. Elec Wld—Sept. 21, 1918. Its use has made it possible to meet demands and conserve material and labor.

The Standard Outdoor Substation (88683 A). J. T. Bronson. Ills. 3000 w. Gen Elec Rev—Sept., 1918. Outlines the requirements of outdoor switching apparatus and the types of equipment.

The New 45th Street Substation of the United Electric Light & Power Co., New York (87945 A). Roy R. Kime. Ills. 2500 w. Elec JI—Aug., 1918. Layout and operating arrangements, equipment, etc.

Outdoor Distribution Substations in War Times (89265). Ills. 800 w. Elec Wld—Oct. 5, 1918. Three-phase transformers with automatic pole-top oil switches in primary.

The Automatic Substation Has Come to Stay (89480). Walter C. Slade. 3500 w. Elec Ry JI—Oct. 12, 1918. Outlines the present status of the automatic substation.

Reconstruction of a Two-Phase Station—I (89266-). Ills. 2000 w. Elec Wld—Oct. 5, 1918. Serial, 1st part. How problems made necessary by rapid load development were handled.

The Power Station at Millers Ford (89628). Ills. 2500 w. Elec Rev, Chi—Oct. 19, 1918. Features of Dayton's Power & Light Co.'s new plant.

The Millers Ford Station (89490). Ills. 3500 w. Pwr Pt Eng—Oct. 15, 1918. Interesting features of new Dayton, O., power plant.

Inexpensive 33,000-Volt Outdoor Substations (82483). Ills. 1000 w. Elec Wld—Nov. 17, 1917. Two designs worked out by an Illinois Company.

Summer Load

Economic Aspects of Summer Load (86532). 1800 w. Elec Wld—May 25,

Switchboards

1918. Serial, 1st part. Features of a class service which yields profitable revenue.

Switchboards

Developments in Switchboard Apparatus (82824 A). Ills. 800 w. Gen Elec Rev—Dec., 1917. Outdoor disconnecting switches, fuses, and choke coils for use up to 150,000 volts.

Instruments for Central-Station Switchboards (87396 A). G. W. Stubblings. 1300 w. Elec Rev—June 14, 1918. The degree of accuracy desirable.

The Safe Operation of Power-Plant Switchboards (87767 A). L. Fokes. Ills. 1800 w. Colly Gdn—July 5, 1918. Serial, 1st part. Outlines methods tending to greater safety.

Developments in Switchboard Apparatus (82269 A). Ills. 1500 w. Gen Elec Rev—Nov., 1917. Deals with polyphase induction reverse power relays, and outdoor fuse and disconnecting switch for vertical mounting.

Portable Polyphase Switch Boards (82413 A). F. W. Springer. Ills. 300 w. Eng Ed—Oct., 1917. Boards for pedagogical purposes and their uses.

Switchgear

Some Considerations Relating to Large Power Station Switchgear (87911 A). H. W. Clothier. Ills. 3500 w. Elec'n—June 28, 1918. Deals with oil switches.

GENERATORS AND MOTORS**Armature Reaction****Turbine Plant**

New Turbine Plant at Hull (88597 A). Ills. 1500 w. Elec'n—June 14, 1918. Detailed description of three-phase supply to augment existing system.

Turbine House Plant Operation, with Special Reference to the Rand Power Companies' Plants (88140 N). T. G. Otley and V. Pickles. Ills. 20 pp. So Af Inst Elec Engrs, Trans—May, 1918. Salient points connected with the efficient operation of turbine plant.

Water-Powers

Water-Powers and Industrial Development (82207). Leo G. Denis. From 8th Annual Report, 1917, Com. of Conservation, Canada. 4000 w. Can Engr—Nov. 1, 1917. Canadian water-powers and their importance in industrial development.

Canada's Water Powers and Their Relation to the Fuel Situation (85487). J. B. Challies. Diagrams. 4000 w. Can Engr—April 4, 1918. Read before Can. Soc. Civ. Engrs. Abundance of valuable water powers in various parts of the Dominion.

Winona

The New 5000-Kilowatt Station at Winona, Minn. (88533). Ills. 2000 w. Elec Rev, Chi—Aug. 31, 1918. Mechanical and electrical features of Wisconsin Ry., Light and Power plant.

GENERATORS AND MOTORS**A. C. Generators**

Operating Temperatures in Large A-C. Generators (85339). H. D. Stephens. 1500 w. Elec Wld—March 30, 1918. Comparison of methods of measuring temperatures.

Vertical Shaft Water-Wheel Alternator (85780). H. D. Stephens. Ills. 2500 w. Power—April 23, 1918. Construction, thrust-bearing, methods of lubrication and schemes employed to drive the exciter.

Alternators

The Behavior of Alternators with Zero Power-Factor Leading Current (89016 A). F. D. Newbury. 1500 w. Elec JI—Sept., 1918. Discusses self-excitation, and related matters.

Variation of Alternator Excitation with Load (87295 A). F. D. Newbury. Ills. 3500 w. Elec JI—July, 1918. Factors that affect the amount of increased excitation required to maintain constant voltage with increase of load.

Sudden Short Circuits of Alternators (86337). N. S. Diamant. 2500 w. Elec Wld—May 18, 1918. Critical exposition of electromagnetic phenomena attending sudden short circuits.

Sustained Short-Circuit Phenomena and Flux Distribution of Salient-Pole Alternators (86415 D). N. S. Diamant. Ills. 60 pp. A I E E, Pro—May, 1918. Shows that all the complicated phenomena of s. s. c. can be explained by taking proper account of certain details and secondary effects.

Notes on the Maintenance of Turbo Alternators (86132 A). L. Fokes. Ills. 5500 w. Colly Gdn—Apr. 12, 1918. Systems of ventilation; air filtering; cleaning; over excitation, etc.

The Commutator Machine as the Standard Single-Phase Type (86361 A). F. Creedy. Abstract of paper before the Assn. of Supervising Electricians. 2200 w. Elec'n—Apr. 19, 1918. Serial, 1st part. Advances claims for the universal employment of the commutator motor on single-phase circuits to the exclusion of the single-phase induction motor.

Armature Reaction

Armature Reaction of Polyphase Alternators (85408 A). F. D. Newbury. Ills. 3000 w. Elec JI—April, 1918. Serial, 1st part. Analysis of armature windings.

GENERATORS AND MOTORS

Daylight Saving

Armatures

Rewinding Direct-Current Armatures (84718). R. Thistlewhite. Ills. 3000 w. Power—March 5, 1918. General principles to be observed.

Asynchronous

La Machine Asynchrone A Bagues (88-404 D). M. Latour. Ills. 4500 w. Bul Société Française Des Électriciens—June, 1918. Current and voltage conditions in asynchronous machines.

Asynchronous Motors

Moteurs Asynchrones A Courants Alternatifs (86455 B). J. A. Montpellier. Ills. 3300 w. L'Industrie Électrique—Apr. 10, 1918. Serial, 1st part. Asynchronous motors on alternating current under conditions of short circuited rotor.

Automatic Control

Automatic Control for Electric-Motors (86343 N). Frank Broadbent. Ills. 1600 w. Beama J1—April, 1918. Typical applications illustrating method.

Auxiliaries

Control of Station Auxiliaries (86204) Ills. 1000 w. Elec Wld—May 11, 1918. Methods used to good advantage by Chicago company.

Balancing

The Balancing of Heavy Rotors (88975 N). M. W. Torbet. Ills. 2500 w. Am Soc Nav Engrs, J1—Aug., 1918. A mathematical study.

Batteries

Large Batteries for Power Purposes (86429 N). E. C. McKinnon. Ills. 17 pp. Instn E E—April 25, 1918. Evolution, design, standardization, high-tension batteries, central station batteries, control, etc.

See also same heading under Electro-Chemistry.

Carbons

The Action of Dirt on Railway Motor Carbons (84762 A). J. S. Dean. Ills. 1000 w. Elec J1—March, 1918. Interesting tests and results.

Cap-Rings

Turbo-Rotor Cap-Rings (84136 A). R. Roberts. Ills. 1600 w. Elec'n—Jan. 18, 1918. Serial, 1st part. Calculations of stress, and points in design.

Clutch

Differential Electro-Magnetic Clutch (84289 A). Ills. 2500 w. Engr—Jan. 25, 1918. Details of clutch, devised by Walter L. Davies and Alfred Soames, for controlling the electrical output of a dynamo and the mechanical output of a motor.

Magnetic Clutch (84287 A). Ills. 1500 w. Engr—Jan. 25, 1918. Describes an automatic magnetic clutch.

Coal Conservation

Getting More Energy Out of Coal in the Power Plant (86328). Hartley LeH. Smith. 3000 w. Elec Ry J1—May 18, 1918. Points on low coal consumption and high efficiency.

Commutation

Commutation in Alternating-Current Machinery (84385 D). Marius C. A. Latour. Ills. 25 pp. A I E E, Pro—Feb., 1918. Theoretical considerations of commutation in polyphase and single-phase machinery.

Laminated Commutating Poles (82802). C. G. Lewis. Ills. 1000 w. Elec J1—Dec., 1917. Explains their advantages.

Calculation of Commutators of Alternating-Current Machines (88595 A). M. Schenkel. 1600 w. Elec'n—June 14, 1918. Formulae are given and their application shown.

Commutators

Iron Commutators (87294 A). B. G. Lamme. 2000 w. Elec J1—July, 1918. Explains reasons why iron commutators are not desirable.

The Care of Commutators of Direct-Current Machinery (84015 A). L. Fokes. 3000 w. Colly Gdn—Jan. 11, 1918. Proper attention to repairs and to points that will avoid their necessity.

Condensers

Pre-Charged Condensers in Series and in Parallel (86417 D). V. Karapetoff. 2000 w. A I E E, Pro—May, 1918. Investigates the action of a pre-charged condenser used as a booster in series with some source of e. m. f. for charging another condenser. Deduces the equations of a general network of such condensers. Explains Delon's apparatus.

Controllers

Some Fundamental Problems of Industrial Control (83145). C E Clewell. 1500 w. Elec Wld—Dec. 22, 1917. Serial, 1st part. Principal functions of controllers outlined.

Converters

The Commutating-Pole Windings of a Synchronous Booster Converter (82807). M. W. Smith. Ills. 1500 w. Elec J1—Dec., 1917. Explains how the auxiliary winding compensates for the motor and generator action of the booster.

Daylight-Saving

The Effect of Daylight Saving on Load (86203). 1600 w. Elec Wld—May 11, 1918. Data and curves showing how the daylight-saving law affects central stations in the middle west.

GENERATORS AND MOTORS

Generators

D. C. Armatures

Elementary Principles of Continuous-Current Armature Winding (85784 A). F. M. Denton. Ills. 2000 w. Elec'n—March 29, 1918. Serial. 1st part. Classes of windings explained and terms defined.

D. C. Generator

The Direct Current Generator (84997 N). E. B. Millar. 1200 w. Comwh Engr—Feb. 1, 1918. Serial, 1st part. Results of experimental tests of the relations between speed, generated electromotive force, magnetic flux, armature conductors, and the field exciting forces.

A Direct-Current Generator for Constant Potential at Variable Speed (88216 D). S. R. Bergman. Ills. 8 pp. A I E E, Pro—Aug., 1918. A new solution of this problem and its advantages.

Parallel Operation of Direct-Current Generators (85661). T. F. Barton. Ills. 1200 w. Power—April 16, 1918. Adjustments to obtain the proper characteristics.

D. C. Machinery

Outline of Course in Direct-Current Machinery (84913 A). H. C. Bartholomew. 13 pp. Eng Ed—Feb., 1918. Presents outline suggested.

D. C. Motors

Speed Characteristics of Small D. C. Motors (82804). B. H. Chatto. 1000 w. Elec J1—Dec., 1917. Conditions of starting and running torque.

The Development of Direct-Current Motors (82801). A. Brunt. 2000 w. Elec J1—Dec., 1917. Requirements, progress, efficiency, etc.

Design

Notes on the Design of Electromagnetic Machines (84826 A). Stanley Parker Smith. 2000 w. Elec'n—Feb. 15, 1918. Third part of a serial. Deals with the design of an a.c. turbo-generator.

Dynamo Design

Output Coefficients for D.-C. Motors of Small Size (84296). E. W. Kellogg. 800 w. Elec Wld—Feb. 16, 1918. Convenient method of arriving at trial values of armature diameter and length before designing the winding.

Electrical Apparatus

Installation and Care of Large Electrical Apparatus for Steel Mills (89011 A). O. Needham. 4000 w. Elec J1—Sept., 1918. Discusses precautions applying particularly to the larger motors and their accessories.

The Protection of Electrical Apparatus (89013 A). P. M. Lincoln. 3000 w. Elec J1—Sept., 1918. Various methods of securing the integrity of electrical insulation.

The Use of Graphic Instruments in Improving the Operation of Electrical Apparatus and Reducing Cost of Maintenance (89015 A). J. H. Overpeck. 2000 w. Elec J1—Sept., 1918. Analysis of motor failures and method of studying the operating cycle by means of graphic instruments.

Electric Motors

Electric Motors: Their Types, Characteristics, Applications and Control (85521 A). R. E. Neale. 2000 w. Mech Wld—March 22, 1918. Serial. 1st part. Review of principal types, their construction, etc.

Electrical Plants

Progress in Electrical Power Plants (86507 A). Harry Webber. 7 pp. Keighley Assn Engrs—1916-17. Covers a period of about twenty years.

Electric Power

Relation of Load-Factor to Operating Cost of Electric Drive (86086). D. R. Shearer. 2500 w. Elec Rev, Chi—May 4, 1918. Importance of maximum demand and load-factor on charges for electric power.

Factory Motors

Care and Operation of Electric Motors in Factories (89673). Joseph P. Collopy. Ills. 4000 w. Elec Rev, Chi—Oct. 26, 1918. Points on maintenance of direct-current, induction, and synchronous motors.

Fires

Extinguishing Fires in Large Totally Enclosed Generators and Motors (83618 A). M. A. Savage. Ills. 1500 w. Gen Elec Rev—Jan., 1918. Recommends the use of steam where permissible.

Fires in Turbo-Generators (83721). M. A. Walker. 1800 w. Power—Jan. 22, 1918. Possible means of combating these fires.

Flashing

Protection from Flashing for Direct Current Apparatus (86952 D). J. J. Linebaugh and J. L. Burnham. Ills. 11 pp. A I E E, Pro—June, 1918.

The Flash Suppressor (86017 A). N. W. Storer and F. T. Hague. Ills. 3500 w. Elec J1—May, 1918. Suppresses the causes of flashing. Describes tests.

Fuses

The Development of 2500-Volt Fuses (88646). Robert Charles Cole. 2200 w. Elec Wld—Sept. 7, 1918. Development of a fuse for high-power short circuits.

Generators

Un Moyen De Forcer La Puissance D'Un Générateur Électrique (87120 B). C. Vallet. 2200 w. L'Industrie Électrique—May 25, 1918. Methods in use for keeping the running temperature

Generator Control

GENERATORS AND MOTORS

Induction Motors

of a generator within certain limits while increasing the kilowatt output of the machine.

Generator Control

La Régulation Des Groupes Électrogènes (89710 B). L. Barbillion. Ills. 4000 w. Rev Générale des Sciences—Aug. 15-30, 1918. Methods of regulation employed for electric generating sets.

Generator Sets

The Growth in Size of Generating Sets (88143 N). A. McKinstry. 1500 w. Comwh Engr—July, 1918. Precis of presidential address to Elec. Assn. of Australia. Development.

Generator Test

A Solution for an Acceptance-Test Problem (83685). W. B. Kouwenhoven. 1500 w. Elec Wld—Jan. 19, 1918. Simple method of correcting generator-unit load—characteristic curve for variations in speed.

Tests of a Small Engine-Generator Set (82959 A). J. E. Emswiler. 1000 w. Mich Tech—Dec., 1917. Extensive economy tests of a 10 kw. engine-generator set.

Germany

Les Distributions D'Électricité En Allemagne (86498 B). J. De Soucy. Ills. 3200 w. Génie Civil—Apr. 27, 1918. Distribution of electrical energy in Germany. Present status and the tendency toward State monopoly.

Hydro-Electric

Hydro-Electric Power in Relation to Industry (85995 A). J. A. Johnson. 4500 w. Met & Chem Eng—May 1, 1918. Inquiry into the classification of industries and water-power developments with a view to securing efficiency.

Hydro-Electric Power in India (86487). 1200 w. Times Engng Supp—Apr. 26, 1918. Its present status and possible further development.

The Automatic Hydroelectric Plant (86416 D). J. M. Drabelle and L. B. Bonnett. Ills. 10 pp. A I E E, Pro—May, 1918. Plant at Cedar Rapids, Iowa. See also under *Generating Stations*.

Induction Motors

Low Over-All Cost and Continuous Production (89174). A. P. Lewis. 2500 w. Elec Wld—Sept. 28, 1918. Factors to be considered in purchasing, installing and maintaining induction motors.

Control of Induction Motors (88647). C. E. Clewell. Ills. 2000 w. Elec Wld—Sept. 7, 1918. Fundamental features of induction-motor starters, details of types

designed to cover special requirements during the starting interval.

High-Power Factor Induction Motors (88820). Marius Latour. Ills. 5000 w. Elec Wld—Sept. 14, 1918. Various arrangements for variable-speed motors that have been proposed in the last fifteen years, with particular reference to French developments.

Notes on the Three-phase Induction Motor (88602 A). L. Fokes. Ills. 3500 w. Colly Gdn—Aug. 9, 1918. Fundamental principles of operation and constructional details.

Théorie Simplifiée Du Moteur D'Induction Monophasé (85130 B). A. Normier. Ills. 2100 w. L'Industrie Électrique—Feb. 10, 1918. Serial, 1st part. Theory of the single phase induction motor treated by simple mathematics.

Induction Motor Troubles (87751). Gordon Fox. 1500 w. Power—July 23, 1918. Serial, 1st part. Troubles occurring outside of the motor are discussed in this number.

Calculation of Performance of Induction Motors Working in Conjunction with Flywheels and Slip Regulators (88378 A). Herbert Vickers. 1200 w. Elec'n—July 19, 1918. Serial, 1st part. Mathematical.

A Physical Conception of the Operation of the Single-Phase Induction Motor (85765 D). B. G. Lamme. Ills. 30 pp. A I E E, Pro—April, 1918. A study of the action, found convenient from the educational standpoint.

No-Load Conditions of Single-Phase Induction Motors and Phase Converters (85764 D). R. E. Hellmund. 85 pp. A I E E, Pro—April, 1918. Shows methods and derives formulas for the determination of the fields, the stator and rotor magnetizing currents, etc.

Reconnecting Induction Motors—For Changes in Number of Poles (85500). A. M. Dudley. Ills. 2500 w. Power—April 9, 1918. Effect on operation.

Checking Induction Motor Connections (82809). F. D. Newbury. Diagrams. 1000 w. Elec J1—Dec., 1917. Possible mistakes in connecting three-phase windings.

Mistakes in Induction Motor Windings (82808). A. M. Dudley. Ills. 1500 w. Elec J1—Dec., 1917. Errors which may occur in winding and connecting.

Reconnecting Induction Motors—For Changes in Phase (82367). A. M. Dudley. Ills. 2500 w. Power—Nov. 13, 1917. Serial, 1st part. Factors affected when the winding of a two-phase motor is reconnected to operate on a three-phase circuit, and vice versa.

GENERATORS AND MOTORS

Motor Selection

Inductor Type

Characteristics of the Inductor Type Generator (85962). Millard C. Spencer. Ills. 3000 w. Elec Rev, Chi—Apr. 27, 1917. Standard type for wireless stations. Method of operation, testing, etc.

Insurance

Insurance of Electrical Machinery (83737 A). C. Stuart Buyers. 1200 w. Elec Rev—Dec. 21, 1917. Serial, 1st part. Underlying principles of the usual methods of insuring electric plant.

Insulation

Methods of Insulating A. C. Generator Coils (88582). H. D. Stephens. Ills. 1000 w. Power—Sept. 3, 1918. Characteristics and merits of the various kinds of insulation and methods of applying.

Interconnection

Interconnected Power Systems of the South (85997 A). Ills. and Map. 10 pp. Met & Chem Eng—May 1, 1918. Hydro-electric systems of independent companies operating in five states are connected into one vast transmission system.

Interpoles

Practical Points Concerning Interpoles (88376 A). Ills. 1000 w. Elec Rev—Aug. 2, 1918. Methods of making the polarity of the interpoles right.

Lubrication

Lubrication and Electrical Plant (87394 A). G. Basil Barham. 2500 w. Elec Rev—May 31, 1918. Discusses lubricants, and the effect of the war on quality. Tests and results.

Machine Output

Versuch technische Beiträge zur Auslaufmethode (86469 B). A. Imhof. Ills. 3700 w. Schweiz Elektrotech Verein Bul—Mar., 1918. Review of methods for determining the output of machines of different sizes; iron losses, etc.

Motor Control

Control System for Cement-Mill Motors (89206). William H. Easton. Ills. 800 w. Elec Rev, Chi—Sept. 28, 1918. Interesting system recently installed at Siegfried, Pa., for controlling groups of large high voltage motors.

Remote Control for Squirrel-Cage Motors (87915 A). L. E. Wood. Ills. 1500 w. Elec Rev—July 12, 1918. Advantages of a remote-control system. Describes an installation in Canada.

The Control of Motors Operating Transportation Machinery (83361 N). T. G. Travis. Ills. 1500 w. Elec'n—Dec. 14, 1917. (Special No.) Contactor control, particularly switchgear for cranes, transporters, etc.

Motor Faults

Electric Motor Faults (88476 A). J. Humphrey. 4000 w. Ir & Cl Trds Rev—

Aug. 2, 1918. Troubles and their causes, with suggestions for remedies.

Motor Operation

Applications of Flywheels in Motor Operation (84462). C. E. Clewell. Ills. 2000 w. Elec Wld—Feb. 23, 1918. Theoretical and practical considerations of the effect which they exert.

Motors

Single-Phase Motors (82120). Gordon Fox. Ills. 2500 w. Pr Pt Eng—Nov. 1, 1917. Serial, 1st part. Theory of operation of types most generally employed.

Braking of Electric Motors (86020 A). E. M. Bouton. Ills. 4500 w. Elec JI—May, 1918. Dynamic braking principles and applications, advantages and disadvantages; friction brakes, etc.

Electric Motors (85988). Gordon Fox. Ills. 4000 w. Pwr Pt Eng—May 1, 1918. Serial, 1st part. Types of machines, their construction and characteristics.

Performance of Polyphase Induction Motors (85947). Justin Lebovici. Ills. 2500 w. Elec Wld—Apr. 27, 1918. Compares commonly used types. Points on which choice should depend.

The Polyphase Shunt Motor (84382 D). W. C. Korthals Altes. Ills. 32 pp. A I E E, Pro—Feb., 1918. Types that seem most important are discussed, particularly the induction motor with commutator on the primary side.

Standardized Motors for the Steel Industry (87182 N). W. T. Snyder, with discussion. 16 pp. Assn I S E E—March, 1918. A plea for standardization.

Motor Ratings

Standardization of Ratings of Large Rolling Mill Motors (88917 N). K. A. Pauly. 10 pp. Assn I S E E—Sept., 1918. The advantages of the standardization of the name or rating of roll motors, and favoring the A. I. E. E. rating.

Motor Selection

Applying Engineering Principles Properly in Motor Selection (88994). C. W. Squier. Curves. 2200 w. Elec Ry JI—Sept. 21, 1918. Shows how to select motor best adapted to meet given requirements.

How to Buy Direct-Current General Utility Motors (88939 A). A. Brunt. Ill. 2500 w. Am Mach—Sept. 19, 1918. Remarks on lack of judgment in writing the specifications for direct-drive work.

Selection of Motors Aided by Graphic Meters (84708). C. E. Clewell. Ills. 2000 w. Elec Wld—March 2, 1918. Consideration of different types.

Selection of Motors for Shipbuilding Plant (84800). David Elwell. Ills. 1500 w. Elec Wld—March 9, 1918. Conditions

Motor Starting**GENERATORS AND MOTORS****Rotors**

influencing individual drive and determination of proper rating. Characteristics of motors for plate-shop machines.

Selection of Steel Mill Auxiliary Motors and Control as Affected by Mechanical Features of the Drive (84770 D). J. D. Wright. Ills. 1500 w. A I E E, Pro—March, 1918. Describes manipulators for blooming mills and their operation, drawing conclusions as to size and types of motor suited for driving.

Some Considerations in Determining the Capacity of Rolling Mill Motors (84771 D). Robert F. Hamilton. 22 pp. A I E E Pro—March, 1918. Details of electric drive, including classification of mills.

Motor Starting

Improving Synchronous-Motor Starting Features (85478). Theo. Schou. Ills. 2000 w. Elec Wld—April 6, 1918. Possible improvements in design with brief record of results.

Parallel Operation

Load Division Between Synchronous Frequency Changers Operating in Parallel (89303). Quentin Graham. 1600 w. Power—Oct. 8, 1918. Serial, 1st part. Treats of the fundamental elements that must be considered.

Power Factor

The Power Factor (88768 A). 2500 w. Colly Gdn—Aug. 23, 1918. Explains how the power factor arises.

Practical Limitations to Power Factor Correction (88277). Ralph Kelly. 2000 w. Elec Rev, Chi—Aug. 17, 1918. Influence of location of corrective apparatus upon generator and conductor capacity and voltage regulation.

See also same heading under *Generating Stations*.

Prime Movers

The Steam Turbine as Applied to the Driving of Electric Generators (82865 A). C. Grant. 2000 w. Mech Wld—Nov. 23, 1917. Serial, 1st part. Advantages, fundamental difference in types, etc.

Protection

The Protection of Alternating Current Generators (84324 N). J. Harcourt Williams. Ills. 1000 w. Beama J1—Jan., 1918. Describes protective devices and their advantages.

Rates

Engineering Data Necessary for an Electric Rate Determination (86424 B). Bert H. Peck, with discussion. 27 pp. West Soc Engrs, J1—Jan., 1918. Outlines methods followed, showing how diversified an investigation is essential.

Relays

Application of Relays to Industrial Control (87662). C. E. Clewell. Ills. 2000 w. Elec Wld—July 20, 1918. Types are considered.

Reactance

Reactance of Synchronous Machines and Its Applications (87685 D). R. E. Doherty and O. E. Shirley. Ills. 88 pp. A I E E, Pro—July, 1918. Part I treats of the calculation and application of the armature self-inductive reactance of synchronous machines. Part II derives a formula for calculating the field self-induction which combines to determine the initial short circuit current.

Remote Control

The Remote Control of Motor-Driven Pumps and Compressors ((89306 A). F. M. Nourse. Ills. 1200 w. Mun Eng—Oct., 1918. Types of controlling apparatus.

Rotary Converters

Utilité Des Convertisseurs Ou Transformateurs Tournants (87119 B). J. A. Montpellier. Ills. 2000 w. L'Industrie Électrique—May 25, 1918. Use of rotary converters and general conditions governing their installation.

On the Effect of Armature Resistance and Reactance on the Terminal Pressures of a Rotary Converter (82835 A). S. Neville. 2500 w. Elec'n—Nov. 23, 1917. Serial, 1st part. Difficulty of estimating the influence; methods, etc.

The Pressure Regulation of Rotary Converters (82982 A). R. G. Jakeman. Curves & diagrams. 2500 w. Elec'n—Nov. 9, 1917. Serial, 1st part. Discusses regulation by means of reactance and by means of a synchronous booster.

Rotor Cores

Design of Rotor Cores for Electrical Machines (83570). William Knight. 800 w. Elec Wld—Jan. 12, 1918. Development of formulas for figuring stresses in high-speed rotor-core punchings.

Rotor Design

The Mechanical Design and Specification of the Turbo-Alternator Rotor (85716 N). S. F. Barclay. Ills. 18 pp. Instn E E—March 26, 1918. Read before Manchester Local Section. Reviews conditions underlying the design and suggests a specification for the guidance of the purchaser.

Rotors

Turbo-Alternator Rotors: Features of Mechanical Design (89387). S. F. Barclay. 8000 w. Pr House—Sept., 1918. Serial, 1st part. Reviews conditions underlying the design.

ILLUMINATION

Central Stations

Secomor

The Secomor. A Kinematic Device which Imitates the Performance of a Series-wound Polyphase Commutator Motor (8438a D). V. Karapetoff. Ills. 18 pp. A I E E, Pro—Feb., 1918. Describes the device and its purposes.

Starters

Starters for Squirrel-Cage Induction Motors, and Their Application (84831 A). L. Fokes. Ills. 3000 w. Colly Gdn—Feb. 15, 1918. Considers the auto-transformer method the best.

Alternating-Current Automatic Starters for Squirrel-Cage Induction Motors (84-067). W. H. Patterson. Ills. 1500 w. Power—Feb. 5, 1918. Operation explained. Applications and limitations.

Starting Motors

Large Single-phase Starting Motors (86761 A). W. C. K. Altes. Ills. 1800 w. Gen Elec Rev—June, 1918. Last of a series of articles on a. c. motors. Shows how the problem of building a large single-phase starting motor was solved economically, application, etc.

Stations

Six-Unit Station Will Develop 165,000 Kw. (86068). Ills. 2000 w. Elec Wld—May 4, 1918. Features of the latest additions to the Northwest Generating Station of the Commonwealth Edison Co.

Future Location of Central Power Stations (86093). Dever C. Ashmead. Map. 2500 w. Power—May 7, 1918. Suggests that the country be divided into districts each served by electric power generated by central stations located at sources of fuel supply.

New 20,000-Kilowatt Steam Plant at Waterloo (86552). Ills. 2000 w. Elec Rev, Chi—May 25, 1918. New turbine station nearing completion in Iowa.

Synchronous Motors

Synchronous Motor Action (88489). Gordon Fox. Ills. 3500 w. Pwr Pt Eng—Sept. 1, 1918. Principles of operation.

What Synchronous Motors Can and

Cannot Do (85211). Will Brown. Ills. 3000 w. Elec Wld—March 23, 1918. Discussion of industrial applications as viewed from the standpoint of performance alone.

Synchronizing

Synchronising of Alternators (88599 A). E. Styff. Abstract from *Electro. Zeit.* Ills. 1000 w. Elec'n—Aug. 2, 1918. Discusses combinations of instruments, lamps and mode of connections.

Temperature Rise

Guarantees for Temperature Rise in Electrical Machinery, with Special Reference to Large Turbo-Generators (8654 N). A. E. du Pasquier, with discussion. 13 pp. So Af Instn Elec Engrs, Trans—July, 1918. Shows that a more scientific basis should be adopted and that there is no good reason for restricting temperature rise, providing suitable materials are obtainable.

Turbo-Generators

Getting the Most Out of Turbo-Generators (85008). L. H. Parker and J. J. Preble. Ills. 2000 w. Elec Wld—March 16, 1918. Benefits from cleanliness and cooling.

Ventilation

The Ventilation of Turbo-Generators (89103 A). J. Humphrey. Ills. 4000 w. Ir & Cl Trds Rev—Sept. 6, 1918. Importance of clean air and means of securing it.

Ventilation Systems for Steam Turbine Alternators (85565 A). E. Knowlton and E. H. Freiburghouse. Ills. 3000 w. Gen Elec Rev—April, 1918. Serial. 1st part.

The present article considers the design of the ventilating system.

Voltage

Some Early Voltage Regulators (82523). Leon L. Pollard. Ills. 1400 w. Power—Nov. 20, 1917. Early troubles and their causes.

Voltages of Magneto Generators (83705). T. L. Channing. Ills. 1200 w. Telephony—Jan. 19, 1918. Factors upon which voltage depends.

ILLUMINATION

Aesthetic Lighting

Linking Science and Art in Lighting (8296). M. Luckiesh. 2500 w. Elec Rev, Chi—Oct. 5, 1918. Serial, 1st part. Opportunities in aesthetic lighting, particularly for interiors, etc.

Illumination

L'Évaluation De La Lumière (87715 B). A. Boutaric. 4000 w. Génie Civil—June 22, 1918. Comparative values of

standards of illumination by a new system of units.

Battlefields

Battlefield Illumination (82530 B). R. C. Kuldell. Ills. 10 pp. Prof-Mem—Nov.-Dec., 1917. An example of practice in America.

Central Stations

Illuminating Engineering as a Commercial Force (82385 N). O. R. Hogue,

Churches

C. L. Law, and E. E. Whitehorne. 2500 w. Ill Eng Soc—Nov., 1917. Evidence of its importance and utility in the central station field.

Churches

The Electric Lighting of Ecclesiastical Buildings (85246 N). William Wilson. 6 pp. Instn E E, JI—March, 1918. Special advantages of electricity: suggestions. L'Éclairage Electrique Des Eglises (86470 B). A. Boutaric. Ills. 3000 w. L'Industrie Electrique—Apr. 25, 1918. Arrangement and intensity of lighting units for church interiors.

Colliery Lighting

Economizing the Colliery Electric Lighting Supply (83770 A). L. Fokes. 2500 w. Ir & C. Tds Rev—Dec. 28, 1917. Ways in which colliery lighting supply can be economically utilized and the consumption reduced.

Color

A Color Symposium (84396 C). Articles by C. E. Ferree and G. Rand, Beatrice Irwin, M. Luckiesh, Irwin G. Priest, H. C. Richards, Leonard Thompson Troland, and discussions. 82 pp. Ill Eng Soc, Trans—Feb. 11, 1918.

Color Hygiene

Color in Illumination (85573 A). Beatrice Irwin. Ills. 2000 w. E Cb Phila, JI—April, 1918. Coöperation between color-science and illuminating engineering in the interest of utility, beauty and hygiene.

Department Stores

The General Level of Illumination Intensities in Large Department Stores of New York City (86272 C). W. F. Little and J. F. Dick, with discussion. 3300 w. Ill Eng Soc, Trans—Apr. 30, 1918. Report of a recent investigation.

Economy

Lighting Curtailment (85609 C). Preston S. Miller, with discussion. Ills. 58 pp. Ill Eng Soc, Trans—March 20, 1918. Accomplishes little as a coal-saving measure.

Eye Protection

Eye Protection and Sight Filters (82555 A). 2000 w. Engng—Nov. 2, 1917. Investigations of Dr. E. K. Martin.

Some General Notes on the Protection of Eyesight (82270 A). W. S. Andrews. Ills. 2200 w. Gen Elec Rev—Nov., 1917. Injury from heat rays, and need of guarding, and ultra violet rays.

Factories

Better Lighting of Machine Shops (86634). F. H. Bernhard. Ills. 5500 w. Elec Rev, Chi—June 1, 1918. Serial, 1st part. First of 12 articles dealing

ILLUMINATION

with improved lighting in as many industries.

Industrial Lighting for Shops (87170). O. L. Johnson. Ills. 1000 w. Ry Rev—June 22, 1918. Importance of proper illumination.

Changing Aspects of Factory Lighting Legislation (85212). C. E. Clewell. Ills. 2500 w. Elec Wld—March 23, 1918. Serial, 1st part. More elaborate classification of requirements desirable.

Factory Lighting

How to Plan Lighting Installation for a Factory (87639). Ills. 3500 w. Elec Rev, Chi—July 13, 1918. Rules for laying out the lighting system.

Effective Lighting of Factories as Judged by Daylight Standards (82960 C). Ward Harrison, with discussion. Ills. 4500 w. Ill Eng Soc, Trans—Nov. 20, 1917. Increased efficiency of modern light sources and the benefits.

Practical Features of Factory Lighting (82784 A). C. E. Clewell. Ills. 3000 w. Machy—Dec., 1917. Principal requirements of artificial lighting.

Factory Lighting Codes and Rules (83969 A). C. E. Clewell. Ills. 4000 w. Ind Man—Feb., 1918. Review of progress, and regulations of Wisconsin, New York, Pennsylvania and New Jersey.

Floodlighting

Simple Methods for Solving Floodlighting Problems (88682 A). H. E. Butler. Ills. 1200 w. Gen Elec Rev—Sept., 1918. Methods and their application to both high-intensity and low-intensity illumination.

Fountains

An Electrically Illuminated Fountain (85356). A. L. Powell. Ills. 1500 w. Elec Rev, Chi—March 30, 1918. Construction and wiring features.

Flickering

Flickering of Electric Lamps (86825 A). K. Simons. Abstract from *Electro. Zeit.*. 1500 w. Elec'n—May 17, 1918. Report of tests made to determine conditions causing flickering with a varying source of light, and other related points.

Fuel Saving

Lighting Curtailment (88127 A). Preston S. Millar, with discussion, references and appendix. Diagrams. 11500 w. E Cb Phila, JI—Aug., 1918. Considers the subject as a coal-saving measure.

See also same heading under INDUSTRIAL MANAGEMENT, Regulation.

Gas Industry

The Value of Illuminating Engineering to the Gas Industry (82384 N). Robert French Pierce. 3800 w. Ill

Glow Lamps

Eng Soc—Nov., 1917. Suggestions for improving service.

Glow Lamps

A Technical Specification for Metal Filament Glow Lamps (82294 A). 2000 w. Elec'n—Oct. 26, 1917. Summarizes the technical conditions proposed by the Swiss Union of Electricity Works relating to the sale of glow lamps.

Historical Lighting

The Historical Lighting of Independence Square, Philadelphia (83832 C). E. F. Kingsbury, with discussion. Ills. 15 pp. Ill Eng Soc, Trans—Dec. 31, 1917. Details of the new lighting recently installed.

Illuminating Engineering

Illuminating Engineering as a Commercial Force (80618 C). O. R. Hogue, C. L. Law, and E. E. Whitehorne, with discussion. 10 pp. Ill Eng Soc, Trans—Oct. 10, 1918. The purposes and organization for the work, achievements and organized development.

Incandescent Lamps

Lamp Policy of the Fuel Administration (88650). 4000 w. Elec Wld—Sept. 7, 1918. By eliminating inefficient types of incandescent lamps the U. S. Fuel Administration expects to save more than 1,000,000 tons of coal a year.

Initial Current Obtained in Incandescent Lamps (84710). C. J. Berry. Ills. 3000 w. Elec Wld—March 2, 1918. Results of investigations on the amount of "overshooting" of the current when metal-filament lamps are thrown in circuit.

Incandescent Lighting

Incandescent Lighting in War Time (89435 A). G. H. Stickney and T. W. Moore. Ills. 2000 w. Gen Elec Rev—Oct., 1918. Résumé of features concerning war time lighting and the value of the service.

United States Fuel Administration's Program for Abolishing Inefficient Types of Incandescent Lamps (89438 A). 2500 w. Gen Elec Rev—Oct., 1918. Saving of one million tons of coal a year estimated by substituting highly efficient lamps for the carbon and gem types.

Indirect Lighting

An Indirect Lighting System in a Textile Plant (86273 C). George Wrigley. Ills. 5000 w. Ill Eng Soc, Trans—Apr. 30, 1918. Describes a system using the largest approved size high efficiency incandescent lighting unit, arranged to give the best possible working conditions.

Industrial Lighting

Artificial Daylight in the Industries (89175). M. Luckiesh. 2500 w. Elec Wld—Sept. 28, 1918. Qualifications of

ILLUMINATION**Lamps**

light required for color discrimination, with examples of daylight lamps installed.

Tendencies in Textile Mill Illumination (89437 A). A. L. Powell. Ills. 1000 w. Gen Elec Rev—Oct., 1918. High intensity needed. Excellent illumination by use of Mazda C lamps with proper reflectors.

Some Modern Methods of Lighting (89494). George H. Stickney, with discussion. Ills. 9500 w. Natl Engr—Oct., 1918. Practical suggestions on the lighting of industrial plants, office buildings and stores.

Industrial Illumination (88886 B). Ills. 15 pp. Cas Eng Mthly—Aug., 1918. Second of a series of articles dealing with practical welfare work and the question of eliminating dangers. Discusses both natural and artificial lighting from these points of view.

How Lighting Interests Can Best Serve the Nation (88697). F. H. Bernhard. Ills. 2500 w. Elec Rev, Chi—Sept. 7, 1918. Needs of industrial lighting.

Some Important Phases of Industrial Lighting (88698). W. T. Blackwell. Ills. 2000 w. Elec Rev, Chi—Sept. 7, 1918. Features of factory lighting.

Laws Regarding Insufficient Lighting (88469 A). Chesla C. Sherlock. 2500 w. Am Mach—Aug. 29, 1918. Court decisions in cases of damage suits where insufficient lighting has been made the cause.

Industrial Lighting

Industrial Lighting Curtailment (86407). C. E. Clewell. Ills. 2500 w. Am Mach—May 23, 1918. Question of coal conservation. Quantity of light used for shop purposes none too great.

Illumination Design

Fundamentals of Illumination Design (86002 A). Ward Harrison. Ills. 10 pp. Gen Elec Rev—May, 1918. Serial, 1st part. Outlines principles entering into illumination design.

Lamps

Les Nouvelles Lampes Électriques (87124 B). A. Soulier. Ills. 2400 w. La Nature—May 4, 1918. Review of recent progress in lamp development.

Mazda Lamps for Motion Picture Projection (86748 A). A. R. Dennington. Ills. 2000 w. Elec JI—June, 1918. Lamps developed for this use and their advantages.

Adapting 220-Volt Circuits to 110-Volt Lamps (83144). J. R. Colville. 1000 w. Elec Wld—Dec. 22, 1917. Reduced lamp costs and higher efficiencies, with other advantages.

Modern Arc Lamps and Incandescent Lamps (83198 A). 1200 w. Elec Rev—Dec. 7, 1917. Serial, 1st part. Shows

Light

there is a field of application for both types.

Light

See same heading under Electro-Physics.

On Preferred Proportions in Combining General and Localized Lighting (82386 N). F. C. Caldwell and W. M. Holmes. 12 pp. Ill Eng Soc—Nov., 1917. Reports test, explaining conditions and giving results. „ „

Lighting Code

New Industrial Lighting Code for Wisconsin (88536). John A. Hoeveler. Ills. 2500 w. Elec Wld—Aug. 31, 1918. New rules define terms used and provide for definite values of illumination and glare.

Code of Lighting School Buildings (82383 N). Ills. 16 pp. Ill Eng Soc—Aug. 30, 1917. First edition of code, circulated for the dissemination of knowledge.

Lighting Economy

Lighting Economy in War Time (86751 A). Preston S. Millar. Ills. 3000 w. Elec J1—June, 1918. Suggestions of value in anticipation of serious fuel shortage during the coming winter.

Lighting Economics

Economics in the Operation of Large Lighting Installations (84397 C). Clarence L. Law and James E. Buckley, with discussion. 18 pp. Ill Eng Soc, Trans—Feb. 11, 1918. Executive details and routines necessary.

Light Emission

The Mechanism of Light Emission (88186 A). E. P. Lewis. 14 pp. Sci M—Aug., 1918. Discusses radiation from the present state of knowledge.

Light Projection

Motion Picture Projection with Tungsten Filament Lamps (86925 C). J. T. Caldwell, A. R. Dennington, J. A. Orange, and L. C. Porter, with discussions. Ills. 7000 w. Ill Eng Soc Trans—June 10, 1918. Account of the development. Advantages and disadvantages of the several systems.

Light Projection with Gas-Filled Lamps (85579). R. P. Burrows and J. T. Caldwell. Ills. 3000 w. Elec Wld—April 13, 1918. Development has made possible their satisfactory use for motion-picture projection.

Light Transmission

Transmission of Light Through Water (87971 A). S. L. E. Rose. Ills. 700 w. Gen Elec Rev—Aug., 1918. Investigations.

Light Treatment

The Relation of Light to Health (88828 A). Charles E. de M. Sajous. 4500 w. E Cb Phila, J1—Sept., 1918. Possibilities

ILLUMINATION

for the development of the applications of light for the preservation of help and care of disease.

Localized Lighting

On Preferred Proportions in Combining General and Localized Lighting (88722 C). F. C. Caldwell and W. M. Holmes, with discussions. Ills. 20 pp. Ill Eng Soc, Trans—Aug. 30, 1918. Report of test, stating conditions and results.

Mechanical Equivalent

See same heading under Electro-Physics.

Mine Lighting

The Safe Operation of Underground Electric Light Systems (84664 A). L. Fokes. Ills. 4500 w. Ir & Cl Trds Rev—Feb. 8, 1918. Important details of mechanical construction and electrical operation.

Motion-Picture Projectors

Mazda Lamps for Motion-Picture Projectors (82823 A). L. C. Porter. Ills. 1500 w. Gen Elec Rev—Dec., 1917. Analysis of difficulties encountered in successfully developing the system.

Motion Pictures

Les Projections Cinématographiques (89082 B). Ills. 2600 w. Génie Civil—Aug. 24, 1918. Incandescent lamps for motion picture projection.

Motorcycles

Electric Lighting System for U. S. A. Motorcycles (85324). P. M. Heldt. Ills. 1500 w. Auto Ind—March 28, 1918. Tests prove possibility of controlling voltage without a battery in circuits.

N E L A

The N. E. L. A. "Win the War" Convention (86896). Ills. 20 pp. Elec Wld—June 15, 1918. Report of proceedings at Atlantic City meeting.

John W. Lieb's Presidential Address (87062). 2500 w. Elec Wld—June 22, 1918. From committee report on the address at Atlantic City, discussing "The Electrical Industry in War Service."

Nomenclature

1917 Report of the Committee on Nomenclature and Standards of the Illuminating Engineering Society (83831 C). 10 pp. Ill Eng Soc, Trans—Dec. 31, 1917.

Office Lighting

Lighting of Offices and Drafting Rooms (86355). Ward Harrison. 2500 w. Elec Rev, Chi—May 18, 1918. Serial, 1st part. Discusses office lighting on modern lines—quantity and quality of light needed.

Photometers

See same heading under Measurement.

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Searchlights

Plant Lighting

The Lighting of New York City's New \$3,000,000 Garbage Disposal Plant (82822 A). A. L. Powell. Ills. 1800 w. Gen Elec Rev—Dec., 1917. Details of process employed, the products, etc., with lighting requirements and successful solution of the problem.

Portable Lamps

Les Lampes Portatives A Magnéto (85147 B). Ills. 4000 w. L'Industrie Électrique—Feb. 25, 1918. Portable lamp with small magneto generators instead of batteries.

Progress

Lighting Progress for the Past Year (83515). H. W. Mateer. Ills. 1500 w. Elec Rev, Chi—Jan. 5, 1918. Progress in industrial and street lighting; development of Mazda motion-picture lamp.

Protective Lighting

The Effective Application of Protective Lighting (86897). H. H. Magdsick. Ills. 2500 w. Elec Wld—June 15, 1918. Requirements. Improper distribution of light a common fault.

Protective Lighting for Manufacturing Plants (86753 A). W. A. McKay. 2000 w. Elec J1—June, 1918. Systems for guarding plants and grounds at night from enemy interference.

Protective Lighting for Industrial Plants (86637). Davis H. Tuck. Ills. 1000 w. Elec Wld—June 1, 1918. Discusses required intensity and distribution of illumination, glare, available units, and desirable methods.

Radiation

Calculation of the Constants of Planck's Radiation Equation: An Extension of the Theory of Least Squares (87456 A). Harry M. Roeser. 17 pp. U S Bur Stds, Vol. 14, No. 2—June 17, 1918. Computation of Planck's constant. Method explained.

Luminous Radiation from a Black Body and the Mechanical Equivalent of Light (87457 A). W. W. Coblentz and W. B. Emerson. 10 pp. U S Bur Stds, Vol. 14, No. 2—June 17, 1918. Applications of the curve of visibility of radiation, for the average eye.

Relative Sensibility of the Average Eye to Light of Different Colors and Some Practical Applications to Radiation Problems (87455 A). W. W. Coblentz and W. B. Emerson. 67 pp. U S Bur Stds, Vol. 14, No. 2—June 17, 1918. Investigation to determine the spectral visibility of radiation curve of the average eye.

Radiation

The Visibility of Radiation (82388 N). Prentice Reeves. Ills. 1300 w.

Ill Eng Soc—Nov., 1917. Data obtained and apparatus used.

Radiography

Single-Impulse Radiography (Instantaneous): Its Limitations and Possibilities (86141 N). Robert Knox. 5000 w. Instn E E—April 11, 1918. Apparatus; development of method; uses.

Radioactivity

Radioactive Luminous Materials (89380 A). Wallace Savage. Ills. 1500 w. Chem & Met Eng—Sept. 28, 1918. Scientific development. Recent uses, etc.

On the Luminescence Due to Radioactivity (88902 B). Enoch Karrer and D. H. Kabakjian. Ills. 24 pp. Fkn Inst, J1—Sept., 1918. Characteristics of self-luminous materials.

Reflectors

Some Experiments on the Eye with Pendant Opaque Reflectors Differing in Lining, Dimensions, and Design (83833 C). C. E. Ferree and Gertrude Rand. Ills. 24 pp. Ill Eng Soc, Trans—Dec. 31, 1917. Investigates seven opaque reflectors.

Some Experiments on the Eye with Pendant Opaque Reflectors Differing in Lining, Dimensions and Design (82387 N). C. E. Ferree and Gertrude Rand. Ills. 25 pp. Ill Eng Soc—Nov., 1917. Investigation of pendant reflectors.

Remote Control

The Phantom Circuit Remote Control System (82266 A). H. H. Reeves. Ills. 800 w. Gen Elec Rev—Nov., 1917. Deals with system for turning on and off groups of street incandescent lamps at a distance.

Residences

The Growth and Present Status of Systems Used in the Maintenance of Gas Lamps in Residences (82961 C). E. B. Myers, with discussion. 3000 w. Ill Eng Soc, Trans—Nov. 20, 1917. Beneficial results of systematic maintenance.

Rockets

Rockets and Illuminating Shells as Used in the Present War (86924 C). A. Bergman, with short discussion. 4000 w. Ill Eng Soc, Trans—June 10, 1918. Description and use.

Schools

Report on Code of Lighting School Buildings (86271 C). Ills. 15 pp. Ill Eng Soc, Trans—April 30, 1918. Aims to serve as a guide in improving lighting conditions.

Searchlights

Development of Electric Searchlight lamps (87067). Louis J. Auerbacher. Ills. 2500 w. Elec Wld—June 22, 1918. Explains newest principle.

Series Incandescent

Military Searchlights (85075 B). Roger Haydock. Ills. 2000 w. Prof Mem—March-April, 1918. Development.

Series, Incandescent

Operation of Series Incandescent Lighting Circuits with Series Transformers (82820 A). E. D. Treanor. Ills. 3000 w. Gen Elec Rev—Dec., 1917. Latest and most highly developed transformer of this type.

Specifications

Standard Specifications for Incandescent Electric Lamps (87453). 10 pp. U S Bur Stds, No. 13—April 13, 1918. General specifications under which lamps are purchased for the Government, with tests.

Street Lighting

Street Lighting with Reference to the Manufacturer, the Central Station, and the Municipality (89436 A). G. L. Thompson. 1500 w. Gen Elec Rev—Oct., 1918. Shows that improvement is not likely to be as great in the future as in the past.

Streets

Ornamental Utilitarian Street Lighting Units (86760 A). S. L. E. Rose and H. E. Butler. Ills. 900 w. Gen Elec Rev—June, 1918. Companion article

MEASUREMENT**Cross Current**

to one appearing in Dec. number of Gen. Elec. Rev. giving data on new types of units.

Street Lighting with Modern Electric Illuminants (82821 A). S. L. E. Rose and H. E. Butler. Ills. 2500 w. Gen Elec Rev—Dec., 1917. Covers both incandescent and arc lamps from the illumination standpoint.

Ultraviolet Rays

See same heading under Electro-Physics.

Underground Lighting

The Design of Low Voltage Underground Lighting Systems (84370 A). L. Fokes. 3000 w. Colly Gdn—Jan. 25, 1918. Present tendency in colliery lighting. Factors which have increased the possibilities of low voltage.

Visible Radiation

The Visibility of Radiation (84398 C). Prentice Reeves, with short discussion. 8 pp. Ill Eng Soc, Trans—Feb. 11, 1918. Comparison of various data obtained in laboratory tests.

War Lighting

Some Features of Special War Lighting (83517). Grable B. Weber. Ills. 800 w. Elec Rev, Chi—Jan. 5, 1918. Lighting of munition plants and training camps.

MEASUREMENT**Alternating Currents**

A New Method of Measuring Alternating Currents and Electric Oscillations (88380 A). I. Williams. Abstract of paper before Physical Soc. Ills. 1000 w. Elec'n—July 19, 1918. A new thermal method is proposed and two new types of instruments described.

The Representation of Alternating-Current Quantities by Vectors (87947 A). Alexander D. DuBois. Ills. 3000 w. Elec JI—Aug., 1918. The substitution of vectors for sine curves.

Precise Measurement of Alternating Currents (86206). C. O. Gibbon. Ills. 2000 w. Elec Wld—May 11, 1918. Elements of two identical electrodynamic meters so connected in Wheatstone bridge that a. c. through elements can be ascertained by measuring d. c. that produces zero torque.

Apparatus for Measuring Very Strong or Very Weak Alternating Currents, with Adjustable Field Magnet (82484). Signor Pestarini. Ills. 2200 w. Elec'n—Nov. 2, 1917. Arrangement comprising a special galvanometer and a static phase transformer fed from an alternating auxiliary source.

Balancing

Methods of Balancing Rotors (89014 A). C. C. Brinton. Ills. 2000 w. Elec JI—Sept., 1918. Considers static balance and dynamic or running balance.

Dynamic Balancing of Rotating Sections (88535). Cecil Hering. 1800 w. Elec Wld—Aug. 31, 1918. Rational unit for expressing and measuring the tolerance allowed.

Bus-Bars

Repulsion Between Bus-Bars (82803). S. G. Leonard and Charles R. Riker. 2200 w. Elec JI—Dec., 1917. Charts and explanation of methods of finding the force exerted.

Conduction

Note on Electrical Conduction in Metals at Low Temperatures (87459 A). Francis B. Silsbee. 1500 w. U S Bur Stds, Vol. 14, No. 2—June 17, 1918. Experimental study of relationship to be expected between the values of critical current and critical field.

Cross-Currents

Cross-Current Predeterminations from Crank-Effort Diagrams (82918 A). Louis Illmer. Ills. 36 pp. A S M E—Dec., 1917. Research study into causes

Currents

of excessive cross-current flow between paralleled alternators when driven by reciprocating engines.

Currents

A New Standard of Current and Potential (84381 D). Chester T. Allcutt. Ills. 7 pp. A I E E, Pro—Feb., 1918. A new standard proposed as a substitute for the standard cell in certain classes of d. c. measurements.

Demand Meters

Classification of Demand Meters with Reference to Central-Station Rates (84460). Chester I. Hall. 1500 w. Elec Rev, Chi—Feb. 23, 1918. Résumé of demand meter development.

The Character of the Thermal Storage Demand Meter (84384 D). P. M. Lincoln. Ills. 22 pp. A I E E, Pro—Feb., 1918. Discusses the character of the quantity measured by this device.

Dielectric Tests

Flexible and Accurate Method for Dielectric Tests (84799). Chester Arthur Butman. Ills. 3500 w. Elec Wld—March 9, 1918. A series-inductance bridge for measuring dielectric energy losses at low frequencies and high potential gradients.

Electrons

Resonance and Ionization Potentials for Electrons in Cadmium Vapor (87565 A). John T. Tate and Paul D. Foote. 8 pp. U S Bur Stds—June 24, 1918. Experimental determination.

Electrostatic Problems

An Experimental Method of Obtaining Solution of Electrostatic Problems with Notes on High-Voltage Bushing Design (82507 D). Chester W. Rice. Ills. 147 pp. A I E E, Pro—Nov., 1917. The electrodynamic method is developed to a high degree of accuracy and applied to the study of high-voltage bushings.

Emf

Simple Method of Measuring Emfs. Accurately (85006). F. Wenner, Paul D. Foote and E. E. Weibel. 1300 w. Elec Wld—March 16, 1918. Applicable to determining temperatures with thermocouples, and other objects.

Galvanometers

A Study of Electromagnetic Moving Coil Galvanometers for Use in Alternating-Current Measurements (86027 A). Ernest Weibel. Ills. 35 pp. U S Bur Stds—April 6, 1918. Theory, construction and performance, uses.

Graphic Wattmeters

The Value of Graphic Instruments in

MEASUREMENT**Insulators**

Improving Motor Drive (86356). T. S. Montgomery and W. B. Bray. Ills. 1500 w. Elec Rev Chi—May 18, 1918. Graphic wattmeters permit detail study and improved operation of motors.

Harmonic Analysis

Application of Harmonic Analysis to the Theory of Synchronous Machines (88907 D). Waldo V. Lyon. 37 pp. A I E E, Pro—Sept., 1918. Shows the presence of harmonics in the current and voltage and in the distribution of the airgap flux. Methods for determining effects, applying to a number of cases.

Harmonics

Obtaining Approximate Values of Harmonics (82482). Waldo V. Lyon. 1200 w. Elec Wld—Nov. 17, 1917. Simple method based chiefly on shape of hysteresis loop.

High Frequency

Appareils De Mesure Et D'Etude Des Courants à Haute Fréquence (89702 B). Ills. 1300 w. Génie Civil—Sept. 14, 1918. Apparatus for measurement of high frequency currents and oscillations.

Inductance

Self-Inductance of Short Reactance Coils (86530). H. B. Dwight. 800 w. Elec Wld—May 25, 1918. Formulas and methods of using information derived.

The Measurement of Small Inductances and on Power Losses in Condensers (84656 A). Albert Campbell. Abstract of paper read before the Physical Soc., London. 1600 w. Elec'n—Feb. 8, 1918. Methods, illustrated by examples.

Induction Meters

Adapting Induction Meters to New Frequency (84709). E. L. Fischer. 1800 w. Elec Wld—March 2, 1918. How a company changed its 60-cycle, watt-hour metering equipment to 25-cycle energy, and later back to 60-cycle at minimum expense.

Influence Des Variations Journalières De La Fréquence Sur Les Indications Des Compteurs D'Induction (86450 D). A. Durand. 3400 w. Bul Soc Internationale des Electriciens—Mar., 1918. Influence of daily variations on accuracy of induction type meters.

Insulation

Periodical Insulation Tests (84760 A). P. M. Lincoln. 1500 w. Elec J'l—March, 1918. Summary of replies to the question of proper tests.

Insulators

The Electrical Resistivity of Porcelain and Magnesia at High Temperatures (86978 N). P. H. Brace. Ills. 7

Iron Properties

pp. Am El Chem Soc—April, 1918. Report of tests.

Iron Properties

Thermoelectric Measurement of Critical Ranges of Pure Iron (86026 A). George K. Burgess and H. Scott. Ills. 1800 w. U S Bur Stds—April 6, 1918. Investigations, giving methods and results.

Line Calculations

Graphical Determination of Line Constants (85005). T. A. Wilkinson. 1500 w. Elec Wld—March 16, 1918. Three charts which assist in the evaluation of the hyperbolic transmission-line formula.

Line Tests

Tests of Iron-Wire Transmission Line (82621). 700 w. Elec Wld—Nov. 24, 1917. Comparison of losses in similar iron-wire and copper-wire lines shows that former type is not advisable on certain classes of lines.

Loads

Predicting Load on Residence Circuits (86202). P. O. Reyneau. 1600 w. Elec Wld—May 11, 1918. Data of assistance in making estimates of future requirements.

Magnetic Uniformity

Determination of the Degree of Uniformity of Bars for Magnetic Standards (86025 A). Raymond L. Sanford. Ills. 2500 w. U S Bur Stds—April 6, 1918. Describes method for determining the degree of magnetic uniformity along the length of a straight bar; effect of non-uniformities, etc.

Magnetic Susceptibility

La Susceptibilidad Magnética Del Bismuto Y Del Antimonio (89059 D). H. Isnardi. Ills. 4500 w. Universidad Nacional De La Plata—Dec., 1917. Magnetic reluctance of bismuth and antimony.

Meter

The Selection of an Electricity Meter (84369 A). 2000 w. Elec Rev—Jan. 25, 1918. Considers quality, cost, and commercial service.

An Electrolytic Metering Case (86826 A). Ills. 1800 w. Elec'n—May 17, 1918. A device designed to take the place of the d. c. watt-hour meter for small customers.

Demand Meters (87970 A). J. A. Laubenstein. Ills. 1500 w. Gen Elec Rev—Aug., 1918. Considers the actual measurement of demand and describes types of meters.

The Foot-Candle Meter (87758 C). C. F. Sackwitz. Ills. 10 pp. Ill Eng Soc, Trans—July 20, 1918. A small portable self-contained device for measuring illumination.

MEASUREMENT**Promoters**

Testing Watthour Meters (84692). R. L. Mossman. Ills. 1200 w. Pwr Pt Eng—March 1, 1918. Methods and schemes of connections employed.

Economies in Central-Station Meter Testing and Repairing (84702). C. W. Geiger. Ills. 1200 w. Elec Rev, Chi—March 2, 1918. Methods in use by the Los Angeles Power Bureau.

Meter Testing

The Percentage Error (89042 A). T. T. Bullen. 1000 w. Elec Rev—Sept. 6, 1918. Ways of working and writing results of meter tests.

Mica

On the Temperature Variation of the Electrical Conductivity of Mica (88598 A). H. H. Poole. Abstract of an article in *Phil. Mag.* Ills. 1500 w. Elec'n—June 14, 1918. Experimental investigations and results.

Permeameter

An Experimental Study of the Fahy Permeameter (87458 A). Charles W. Burrows and Raymond L. Sanford. Ills. 33 pp. U S Bur Stds, Vol. 14, No. 2—June 17, 1918. A critical study with conclusions. Description and operation.

Photometers

An "Average Eye" for Heterochromatic Photometry, and a Comparison of a Flicker and an Equality-of-Brightness Photometer (86029 A). E. C. Crittenden and F. K. Richtmyer. 26 pp. U S Bur Stds—April 6, 1918. Experimental data, showing the difference to be expected in individuals.

Photometry

An Integrating Hemisphere (88723 C). F. A. Benford, Jr. Ills. 28 pp. Ill Eng Soc, Trans—Aug. 30, 1918. Shows that the hemisphere has certain theoretical advantages.

Power Factor Meters

D. C. Calibration of Power Factor Meters (84063). Thomas W. Varley. 800 w. Elec Wld—Feb. 2, 1918. Resistance ratio method.

Power Losses

Measurement of Power Loss in Dielectrics of Three-Conductor High-Tension Cables (84383 D). F. M. Farmer. Ills. 20 pp. A I E E, Pro—Feb., 1918. Method used at the Electrical Testing Laboratories, the difficulties and methods of overcoming them.

Pyrometers

See same heading under MECHANICAL ENGINEERING, *Measurement*.

Pyrometers—Their Construction and Application (82450 F). John P. Goheen. 2500 w. A I Mt, J1—Sept., 1917. Outlines history of the electric pyrometer, their applications, development, etc.

POWER APPLICATIONS

Anthracite Mines

Radiometry

Instruments and Methods Used in Radiometry, III (87452). W. W. Coblenz. Ills. 29 pp. U S Bur Stds, No. 319—June 17, 1918. The photo-electric cell and other selective radiometers. Applications of certain physical and chemical properties of matter as a means of measuring radiant energy.

Radiations

Spectroradiometric Investigation of the Transmission of Various Substances (88713). W. W. Coblenz, W. B. Emerson, and M. B. Long. 24 pp. U S Bur Stds, Sci paper 325—Aug. 8, 1918. Data on spectral transmission of radiant energy.

Rating

Factors That Determine Maximum Rating of a Direct-Current Machine for a Given Speed (84127 A). F. T. Hague. Ills. 4500 w. Elec JI—Feb., 1918. Analysis of the factors which limit capacity of any machine.

Rheostats

Compression Rheostats (85572 A). Arthur H. Allen. 2000 w. E Cb Phila, JI—April, 1918. Special reference to rheostats known as the Allen-Bradley type.

Speed Indicator

The Squirrel Cage Speed Indicator (82295 A). E. B. Brown. Ills. 1000 w. Elec'n—Oct. 26, 1917. Explains action.

Standards

British Electrical Standards (82672). Charles C. Garrard. 2000 w. Times Engng Supp—Oct. 26, 1917. Need of better coöperation by engineers and manufacturers for safety standards.

Temperature

"Hottest Spot" Temperature in Transformers (87664). Alfred Still. 1500 w. Elec Wld—July 20, 1918. Formula for calculating maximum temperature. Application.

Testing Laboratory

British Electrical Proving House (87150). 1400 w. Times Engng Supp—May, 1918. Benefits to industry expected from a general testing laboratory for manufacturers.

Transformers

See Test Ring Method, under Transformers.

A Method for Testing Current Transformers (87461 A). Francis B. Silsbee. 12 pp. U S Bur Stds, Vol. 14, No. 2—June 17, 1918. A general method outlined, and two convenient modifications.

Tungsten

Reflecting Power of Tungsten and Stellite (87460 A). W. W. Coblenz and W. B. Emerson. 10 pp. U S Bur Stds, Vol. 14, No. 2—June 17, 1918. Investigation of the reflectivity with results.

Voltmeters

Voltmeter Multipliers (86673). E. C. Parham. Ills. 4000 w. Natl Engr—June, 1918. Five quantities to be considered; the formula and its applications.

Wire Sizes

Determination of Economical Power Circuits (86528). P. O. Reyneau. 1200 w. Elec Wld—May 25, 1918. Method of deriving curves which show the most economical wire size.

POWER APPLICATIONS

Agriculture

Electroculture (84590 B). Ills. 2700 w. L'Industrie Électrique—Dec. 25, 1917. Apparatus for high tension discharge for stimulating plant growth.

Electro-Culture of Crops (85210). 1400 w. Times Engng Supp—Feb. 22, 1918. The Chester experiments on growth of crops under stimulation of electric discharges.

Electric Ploughing (84643 A). Ills. 2000 w. Elec Rec—Feb. 8, 1918. Serial, 1st part. Based on remarks by M. Delamarre in *Rev. Gen. de l'Elec.* Power requirements; systems of traction; tractors, etc.

Effect of Artificial Light on the Growth and Ripening of Plants (84776 A). J. L. R. Hayden and C. P. Steinmetz. Ills. 1500 w. Gen Elec Rev—March, 1918. Investigations and results.

Le Labourage Électrique (85889 B). Ills. 2400 w. La Nature—April 6, 1918. Electric tractors for plowing and harrowing taking current through a cable.

American

America's Energy Supply (86951 D). Charles P. Steinmetz. 24 pp. A I E E, Pro—June, 1918. Requirements for the economical utilization of the country's energy supply.

Electric Heating in Manufacturing (87099 A). Thomas Robson Hay. 2800 w. Ind Man—July, 1918. Advantages and disadvantages; points in installing and operating.

Anthracite Mines

The Use of Electric Power in the Mining of Anthracite Coal (89411 D). J. B. Crane. Ills. 1000 w. A I E E, Pro—Oct., 1918. Gives power cost and current consumption in anthracite mines, and

Argentina

reasons for these being in excess of bituminous mines. Representative installations.

Argentina

Argentina as a Field for Electrical Enterprise (84323 N). 4500 w. Beama JI—Jan., 1918. Progress during the last half century; hints on publicity and merchandizing methods.

Auxiliaries

Motor-Driven Auxiliaries (88331 A). C. Grant. 1500 w. Mech Wld—June 14, 1918. Serial, 1st part. Claims the electric motor fulfills all requirements.

Bakery

Operating Features of Motor Drive in a Bakery (86084). Ills. 1000 w. Elec Rev, Chi—May 4, 1918. Central Station service used by Century Biscuit Co., Indianapolis.

Baling

Electric Baling Presses (83131 A). Ills. 1000 w. Engng—Dec. 7, 1917. Particulars of a patent press made in Manchester, Eng.

Brass Melting

The Present Status of Electric Brass Melting (89350 A). H. M. St. John. Ills. 8500 w. Chem & Met Eng—Sept. 15, 1918. Survey of the applications of electric furnaces to the melting of brass and other copper alloys.

Clutch

Electro-Magnetic Clutch for a Planing Machine (86250 A). Ills. 1800 w. Engr—April 26, 1918. Details of what is claimed to be a thoroughly practical magnetic clutch, manufactured in Kilmarnock.

Coal Mining

Electricity in Coal-Mining Operations (87443). Frank Huskinson. Ills. 1500 w. Elec Rev, Chi—July 6, 1918. Serial, 1st part. Factors governing selection of electrical equipment, advantages of central station service.

Cooking

Discussion on "Electrical Cooking as Applied to Large Kitchens" (84823 N). 11500 w. Instn E E, JI—Feb., 1918. Discussions at Manchester and Yorkshire of W. A. Gillott's paper.

See Kitchens, under INDUSTRIAL MANAGEMENT, *Welfare and Safety*.

Some Features in the Design of Domestic Electric Ranges (82267 A). J. L. Shroyer. Ills. 3300 w. Gen Elec Rev—Nov., 1917. Requirements of an electric range, the difficulties met, etc.

Cottrell Processes

Cleaning Foundry Air Electrically (89,649). H. D. Egbert. From paper read at Milwaukee meeting of Am. Fnd. Assn. Ills. 3000 w. Ir Trd Rev—Oct. 24, 1918.

POWER APPLICATIONS**Electric Drive**

Foreign matter charged with static electricity and deposited on collecting electrodes.

The Cottrell Processes in the Sulphuric Acid Industry (89348 A). A. A. Heimrod and H. D. Egbert. Ills. 4500 w. Chem & Met Eng—Sept. 15, 1918. Account of the successful application of electric precipitation for the removal of dust from roaster gases and acid mist from exit gases.

Cranes

Rules for Safe Operation of Electric Cranes (88912 N). 7 pp. Assn I S E E—Sept., 1918. Code of rules presented by the Safety Committee.

Motors and Control for Traveling Cranes (83689). C. E. Clewell. Ills. 2000 w. Elec Wld—Jan. 19, 1918. Eleventh article of a series on motor and control applications.

Diathermy

Diathermy: The Use of the Electrical Current to Raise the Temperature of the Body in the Treatment of Disease (86142 N). E. P. Cumberbatch. 2000 w. Instn E E—April 11, 1918. The current used; construction of diathermy machine; application, etc.

Drainage

Electrische polderbemaling (89056 B). A. W. C. Dwars. Ills. 9800 w. Ingenieur—July 27, 1918. Electric pumping for drained lands in Holland. Kinds of pumps used.

Electrical Apparatus

Development in Electrical Apparatus During 1917 (83519). 5000 w. Elec Rev, Chi—Jan. 5, 1918. Review of progress prepared by the Westinghouse Electric & Manufacturing Co.

Electrical Equipment

Principles and Operation of Modern Electrical Equipment (85341). A. M. Pére. Ills. 1500 w. Pr House—March, 1918. Serial. 1st part. Practical applications of electricity in industrial engineering.

Electric Cooking

Electric Cooking as Applied to Large Kitchens (83107 N). W. A. Gillott. 10 pp. Instn E E—Nov., 1917. Advantages that justify the installation.

Electric Drive

Economy of Electric Drive in Cane Sugar Mills (85566 A). C. A. Kelsey. Ills. 7000 w. Gen Elec Rev—April, 1918. General and specific advantages, particular attention being given to the direct-connected motor-driven centrifugal pumps.

Solving Woodworking Drive Problems (85755). W. A. Black. Ills. 1500 w. Elec Wld—April 20, 1918. Method that practically eliminated repairs and reduced power bills.

Electric Furnaces

Electric Power for Industrial Operations (82219). C. E. Clewell. Ills. 2000 w. Elec Wld—Nov. 3, 1917. Serial, 1st part. Importance of electric drive in industries where labor constitutes a large part of expense.

Electric Furnaces

Electric Furnace Installation (85062 A). Thomas Robson Hay. 2500 w. Iron Age—March 21, 1918. Precautions to be observed in promotion work and the selection of the unit.

Electric Kitchens

The Automobile Electric Kitchen (85567 A). Anson S. Rice. Ills. 2200 w. Gen. Elec Rev—April, 1918. Of special interest in connection with its use at army encampments.

Electric Range

A Study of Electric Range Efficiency (84300). R. G. Kloeffer. Ills. 1800 w. Elec Wld—Feb. 16, 1918. Serial, 1st part. Test results on both open and inclosed heating units.

Electric Stops

Water Indicator and Motor Stop (88330). Frank Huskinson. Ills. 1000 w. CI Age—Aug. 22, 1918. Eliminated the tank overflow by means of electric stops.

Electrical Troubles

Happenings in the Electrical Operating Field (82256). E. C. Parham. 2500 w. Natl Engr—Nov., 1917. Incidents dealing with elevators, motor generator sets, springs, insulated shoes, etc.

Electricity in War

Use of Electricity in the European War (82221). Gustave P. Capart. Ills. 1200 w. Elec Wld—Nov. 3, 1917. Transmission lines indispensable; electric organization, etc.

Electroculture

Notes on Electroculture (88596 A). Ingvar Jörgensen. 3000 w. Elec'n—June 14, 1918. Deals with the branch of electroculture from an overhead network.

Electrometallurgy

The Electric Furnace and Central Station (82862 A). Edwin L. Crosby. From paper before Am. Fndry. Assn. 2000 w. Iron Age—Dec. 6, 1917. Future of the electric steel furnace.

Elevators

Maintenance of Electric Elevators (85012). Charles W. Naylor. 1800 w. Power—March 19, 1918. Cable and brake troubles, iron vs. steel ropes, need of lubrication, etc.

Excavator

Electric Control of a Dragline Excavator (84302). L. W. Nickel. Ills. 1500 w. CI Age—Feb. 16, 1918. Advantages over steam shovel.

POWER APPLICATIONS**Heating****Farm Work**

Electricity Speeding Up Farm Work in Idaho (84320). C. O. Crane. Ills. 1800 w. Elec Rev, Chi—Feb. 16, 1918. Advantages of power and light.

Electric Ploughing (84248 A). A. Delamorre. Abstract from *Rev. Gen. de l'Elec.* Ills. 2000 w. Elec'n—Jan. 25, 1918. Serial, 1st part. Amount of power necessary; various systems and methods.

Some Experiments in the Use of Electric Power for Field Work on the Farm (84175 A). J. H. Davidson and F. E. Boyd. Ills. 2200 w. Gen Elec Rev—Feb., 1918. Possibilities of using power from existing transmission lines.

Fertilizer Plants

The Fertilizer Industry and Its Power Requirements (84171 A). J. E. Mellett. Ills. 14 pp. Gen Elec Rev—Feb., 1918. Application of electric drive to this industry, and the average power requirements.

Fire Alarms

Some Notes on Public Fire-Alarm Systems (88838 A). G. W. Stubbings. 1500 w. Elec Rev—Aug. 23, 1918. Mode of action of the usual system with technical details.

France

La Houille Blanche Pendant La Guerre (89724 E). H. Cahen. 7200 w. Soc Ingénieurs Civils De France—April-June, 1918. Electric power; its available amount and industrial use.

Fuel

Fuel Economy and Electricity (86489). 1000 w. Times Engng Supp—Apr. 26, 1918. Possibilities of coal saving by installation of various electrical appliances for domestic use.

Furniture Factories

Electricity in Furniture Manufacture (82336). Ills. 1200 w. Elec Rev, Chi—Nov. 10, 1917. Advantages and data on h.p. requirements.

Garment Making

Electricity in Garment-Making Factories (84758 A). William H. Easton. Ills. 1500 w. Elec JI—March, 1918. Conditions of the industry, motors for various services, and other electrical appliances.

Glass

Les Méthodes Electrothermiques De Fabrication Du Verre (82696 B). J. Escard. Ills. 5000 w. Industrie Electrique—Nov. 10, 1917. Electrothermic methods in the manufacture of ordinary and of quartz glass.

Heating

Electricity as a Substitute for Natural Gas for Heating Purposes (87554 B). Frank Thornton, Jr., with discussion.

Heating Appliances

17 pp. Engrs' Soc W Penn, Pro—April, 1918. Fundamental features of the problem and industrial applications.

Elektrische Wärmeerzeugung für industrielle Anlagen (86467 B). F. Rutgers. Ills. 2700 w. Schweizerische Bauzeitung—April 27, 1918. Various examples of electric heating for manufacturing operations. Core ovens, water heating, etc.

Heating Appliances

Electrically Heated Industrial Appliances and Devices (89687 A). George J. Kirkgasser. Ills. 3500 w. Ind Man—Nov., 1918. Outlines the most important applications, describing devices used.

Heat Treatment

Electric Furnace for Heat Treating of Small Airplane Parts (88467 A). Dwight D. Miller. 3500 w. Am Mach—Aug. 29, 1918. Methods give very uniform results.

Electric Treatment of Airplane Forgings (88224 A). Dwight D. Miller. Ills. 3000 w. Iron Age—Aug. 15, 1918. Details of the Bailey furnace.

Hoists

Recent Developments of Electric Skip Hoists and Bell Hoists for Blast Furnaces (85715 N). David L. Linquist, with discussion. Ills. 52 pp. Assn I S E E—Feb., 1918. New developments in both alternating and direct current apparatus, with results of tests.

See also Rolling Mills, under ELECTRICAL ENGINEERING, *Power Applications*.

Ice Plant

A Typical Motor-Driven Ice Plant (83854). Ills. 2500 w. Elec Rev, Chi—Jan. 26, 1918. Details of an electrically driven plant with central station supply.

Industrial Uses

Economic Industrial Applications of Electricity (83809 B). Norman T. Wilcox, with discussion. 13 pp. West Soc Engrs, JI—Oct., 1917. Higher efficiencies possible through economic uses of electric service.

Industry

Industrial Applications of Electricity (89483). Dwight D. Miller. Ills. 2500 w. Elec Wld—Oct. 12, 1918. Serial, 1st part. Predicts that the electric heating load will surpass the motor load.

The Electrical Industry in Russia (89523 A). Allan Monkhouse, Jr. 3000 w. Elec Rev—Sept. 20, 1918. Reviews the advance made and the possibilities of development.

Lifting Magnets

Lifting Magnets (83366 N). Ills. 2500 w. Elec'n—Dec. 14, 1917. (Special No.) Operating costs, rating, control, etc.

POWER APPLICATIONS

Lime Plant

A Modern Motor-Driven Lime Plant (87944 A). A. E. Truesdell and C. T. Maynard. Ills. 1200 w. Elec JI—Aug., 1918. Plant of the Vermont Marble Co., near Rutland, Vt.

Logging

Electricity in Logging and Saw Mills (84178 A). E. H. Horstkotte. Ills. 11 pp. Gen Elec Rev—Feb., 1918. Power equipment of a large mill in the West.

Magnetic Pulleys

A Magnetic Steel Band Device (83693 A). P. L. Weston. Ills. 1200 w. Mech Wld—Dec. 28, 1917. From paper before Elec. Assn. of Aust. Experiments with magnetic pulleys and thin steel bands.

Magnets

The Lifting Magnet as an Adjunct to the Electric Steel Furnace (82829 A). Ills. 1000 w. Engng—Nov. 16, 1917. Details of magnet and its uses.

Metal Cutting

Metal Cutting with the Electric Arc (82264 A). Graham Kearney. Ills. 2500 w. Gen Elec Rev—Nov., 1917. Observations on a practical application, with recommendations.

Mill Drive

Electrically Driven Mills (88918 N). J. T. Sturdevant. Ills. 5 pp. Am Ir & St Elec Engrs—Sept., 1918. Shows the layout, equipment, power consumption, tonnages, and capacities of eleven installations at the Lehigh plant of the Bethlehem Steel Co.

Mill Electrification

Electrification of Steam Driven Three-High Merchant Mill at the Frodingham Iron and Steel Works (88600 A). Ills. 1800 w. Elec'n—Aug. 2, 1918. Problems solved with details of the work.

Mine Power

The Economy of Electricity Over Steam for Power Purposes in and About the Mines (85794 D). 2500 w. A I M E, Bul—April, 1918. Discussion of R. E. Hobart's paper.

Mine Pumps

Oerlikon Three-Phase, Low-Speed, Variable-Speed Motors with Large Flywheel Effect, for Direct Coupling to Mine Ram Pumps (88841 A). Ills. 1200 w. Elec'n—Aug. 23, 1918. Serial, 1st part. Characteristics of plant at the Dolcoath mines.

Mining

Some Practical Considerations on Electrical Engineering (87077 A). Chris Jones. 4500 w. Colly Gdn—May 31, 1918. Abstract of paper before S. Wales Inst. of Engrs. Questions on transmitted power. Periodicity of sup-

Mining

Motor Drive

ply, power factor, earth and insulated neutral, cables, transformers, motors, etc.

Requirements, Operation, and Maintenance of Colliery Power Station Switchboards (86771 A). L. Fokes. Diagrams. 5500 w. Colly Gdn—May 10, 1918. Reviews the complete equipment of a power station switchboard indicating the reasons for installing the various apparatus and meters.

Motor Drive

Fan, Blower and Air-Compressor Applications (83858). C. E. Clewell. Ills. 2000 w. Elec Wld—Jan. 26, 1918. Twelfth article of a series. Operating characteristics of different types of apparatus for this service.

Motor Drive in the Preparation of Food (83582 A). Horace B. Smith. Ills. 2000 w. Elec JI—Jan., 1918. Applications to coffee grinders, coffee roasters, meat choppers, meat slicing, ice cream freezers, churns, etc.

Factors Affecting Application of Motors to Lathes (83257). C. E. Clewell. Ills. 2000 w. Elec Wld—Dec. 29, 1917. Ninth article of a series on industrial control.

A Study of Group and Individual Motor Drive (82756). C. E. Clewell. Ills. 1500 w. Elec Wld—Dec. 1, 1917. Conditions under which group drive is favorable. Advantages of individual drive.

Speed, Torque and Power in Machine-Tool Work (82877). C. E. Clewell. 2000 w. Elec Wld—Dec. 8, 1917. Serial, 1st part. Some factors to consider in selecting motors.

Attitude of Machine-Tool Builders to Motor Drive (82619). C. E. Clewell. Ills. 2200 w. Elec Wld—Nov. 24, 1917. Summarizes opinions of ten typical manufacturers all favorable to electric drive.

Oil Fields

Opportunities for Central-Station Power in the Oil Fields (87444). L. E. Mohrhardt. Ills. 4500 w. Elec Rev, Chi—July 6, 1918. Résumé of applications to various operations and data on horsepower requirements.

Paper Mill

Motor Drive in Paper and Pulp Mills (87822). C. E. Clewell. Ills. 1800 w. Elec Wld—July 27, 1918. Serial, 1st part. Important applications; variations in power requirements; examples.

Planers

Operating Characteristics of Motor-Driven Planers (83569). C. E. Clewell. Ills. 2000 w. Elec Wld—Jan. 12, 1918.

POWER APPLICATIONS**Reduction Gears**

Relative merits of non-reversing and reversing motor equipment for planers.

Printing Plants

Application of Printing-Press Motors (88280). C. E. Clewell. Ills. 2500 w. Elec Wld—Aug. 17, 1918. Requirements.

Printing Presses

Electrically-Driven Printing Presses (88852 A). Ills. 2500 w. Engr—Aug. 16, 1918. Particulars regarding a series of electric motors recently installed in Edinburgh.

Pulleys

Uses of Magnetic Separator Pulleys (82610). Ills. 1200 w. Elec Rev, Chi—Nov. 24, 1917. Construction and operation. Examples of applications.

Pumping

Electric Pumping with Results of Tests and Operating Records (83643 N). H. W. Wagner. Ills. 75 pp. Iowa State College, Bul 46—Oct. 3, 1917. Equipment and operation, costs, results of tests, etc.

Electrically Operated Pumping System of New Orleans (83185). Ills. 1800 w. Elec Rev, Chi—Dec. 22, 1917. Details of water, sewage and drainage systems.

Water Pumping by Electric Power (84049). R. L. Yates. 4000 w. Elec Rev, Chi—March 16, 1918. Serial, 1st part. Characteristics of motor-driven pumps and suggestions for selection.

The Automatic Control of Electrically-Driven Hydraulic Pumps (84848 A). Alfred Towler. Ills. 3500 w. Ir & Cl Trds Rev—Feb. 22, 1918. Abstract of paper before the Leeds Assn. of Elec. Engrs. Automatic controllers in use for starting and stopping electrically driven pressure pumps.

Pumping Stations

Electrically Operated Pumping Stations at Rochester (82773). Sydney Alling and John H. Allington. Ills. 3000 w. Elec Rev, Chi—Dec. 1, 1917. How motor-driven centrifugal pumps served from central-station lines make efficient combination.

Quarries

Electrically Operated Quarry and Rock-Crushing Plant in Chicago (87256). 1500 w. Elec Rev, Chi—June 29, 1918. Electric power applied to drills, haulage, crushers, and screens.

Rainfall

L'Emploi De L'Électricité pour La Production Des Pluies (83935 B). 3300 w. L'Industrie Électrique—Dec. 10, 1917. Experimental methods for production of rain by creating an electric field.

Reduction Gears

An Interesting Application of a Reduction Gear (86018 A). T. E. Keating.

Refrigeration

Ills. 1500 w. Elec JI—May, 1918. Details of an installation at Hastings, W. Va., which has proved successful in four years of service.

Refrigeration

See same heading under Mechanical Engineering, Heating and Cooling.

Electricity in Raw-Water Ice Plants (83030). Ills. 3500 w. Elec Rev, Chi—Dec. 15, 1917. Details of typical plants.

Remodeled Plant

Large Savings in Remodeled Plant of Rockwell Manufacturing Co. (82520). Ills. 2500 w. Power—Nov. 20, 1917. Changing from mechanical to individual motor drive effected an annual saving of \$7,440.23.

Rolling Mills

Rolling Mills and the Electric Drive (86851 A). L. Rothera. Abstract of paper before the Manchester Assn. of Engrs. 2500 w. Elec'n—May 24, 1918. Increasing development as compared with steam methods, giving diagrams showing the relation between power demanded and time.

Advantages of Electrified Rolling Mills (82620). William Knight. 3500 w. Elec Wld—Nov. 24, 1917. Considerations to be kept in mind in selecting drive. Useful information on power requirements.

Electric Drive in Rolling Mills (85206). 1300 w. Times Engng Supp—Feb. 22, 1918. Increasing use of electric drive in British rolling mills. Abstracted from paper before Manchester Assoc'n Engrs.

Rolling Mills and Their Electrical Equipments (86379 A). G. M. Brown. Abstract of paper read before the Cleveland Instn. of Engrs. 3500 w. Ir & Cl Trds Rev—March 1, 1918. Serial, 1st part. Determining the electrical plant necessary for a specified output, etc.

Shipyard

Motor Drive in Structural Steel Shop of Newburgh Shipyard (87322 A). W. H. Easton. Ills. 700 w. Int Mar Eng—July, 1918. An example of emergency war installation.

Steam

La Production De La Vapeur Par L'Electricité (83907 B). H. Volta. Ills. 600 w. La Nature—Dec. 15, 1917. Steam generation by passing electric current through salt solution; the Revel system.

Steel Mills

Electrical Plant in Steel Works (89422). Mark Meredith. 2000 w. Pwr Pt Eng—Oct. 15, 1918. Points to be considered in the selection of motors, controllers, and magnets.

POWER APPLICATIONS**Tire-Making**

Application of Motors to Steel-Mill Operations (84064). C. E. Clewell. Ills. 1800 w. Elec Wld—Feb. 2, 1918. Important operations to which motors have been applied. Types adapted.

Steel Plant

Electrical Equipment of the Mark Steel Plant (86199). Joseph P. Collopy. Ills. 3000 w. Elec Rev, Chi—May 11, 1918. Complete electric drive in large new plant manufacturing steel conduit, pipe and plates.

Steel Works

Electrical Plant In Steel Works (87146). 2000 w. Times Engng Supp—May, 1918. Roll motors, lifting magnets, etc., as used in England.

Ship Building

See same heading under MARINE AND NAVAL ENGINEERING.

Silk Industry

Les Transmissions Electriques Dans L'Industrie De La Soie (85254 B). Ch. Vallet. 3500 w. L'Industrie Electrique—Mar. 10, 1918. Serial, 1st part. Electric drive in the silk industry. General considerations.

Sugar Mills

Operating Features of an Electrically Driven Sugar Mill (84703). F. A. Ortiz. Ills. 1600 w. Elec Rev, Chi—March 2, 1918. Economy results in electrification of Cuban mills.

Electricity in Beet-sugar Factories (84773 A). E. M. Ellis. Ills. 2800 w. Gen Elec Rev—March, 1918. Details of the processes employed showing that economy can be secured by electrification.

Textile Mills

Application of Motors to the Textile Industry (84299). C. E. Clewell. Ills. 1500 w. Elec Wld—Feb. 16, 1918. Factors affecting selection of motors and control apparatus.

Therapeutics

I. Diathermy: the Use of the Electrical Current to Raise the Temperature of the Body in the Treatment of Disease. E. P. Cumberbatch. II. Single-Impulse Radiography (Instantaneous): Its Limitations and Possibilities. Robert Knox (88383 N). Two papers with discussion. 18 pp. Instn E E, JI—June, 1918. Problems of the medical profession in the domain of electricity.

Tire-Making

Electricity in the Manufacture of Automobile Tires (87848). B. B. Jackson. Ills. 2000 w. Elec Rev, Chi—July 27, 1918. Serial, 1st part. Process of tire-making; choice of motors and features of control.

TRANSFORMERS

Design

War Plants

Electric Power Supply for War Industries (87661). R. J. McClelland. Map. 4500 w. Elec Wld—July 20, 1918. Shortage of power a war problem. Suggestions for its solution.

Water Works

See Electrification, under CIVIL ENGINEERING, *Water Supply*.

Welding

Electric Welding—A New Industry (89410 D). H. A. Hornor. Ills. 11 pp. A I E E, Pro—Oct., 1918. Reviews the uses of electric spot and arc welding in the United States, the recent development in apparatus, and applications to heavy work.

Electric Welds (89347 A). Ernest Edgar Thum. Ills. 6000 w. Chem & Met Eng—Sept. 15, 1918. Notes on different types of electric welding machines, the properties and microscopy of the welds.

Some Notes on the Resistance Method of Electric Welding (89579 A). G. W. Stubbings. 1400 w. Mech Wld—Sept. 13, 1918. Principle and its application.

See same heading under Mechanical Engineering, Machine Works and Foundries.

Electric Arc Welding (88908 D). A. M. Candy. Ills. 12 pp. A I E E, Pro—Sept., 1918. Methods and applications.

Bibliography of Electric Welding (88684 A). William F. Jacob. 2500 w. Gen Elec

Rev—Sept., 1918. Progress in the art; its application to shipbuilding.

Electric Arc Welding (88945 N). H. L. Unland, with discussion. Ills. 33 pp. Assn I S E E—June, 1918. Its development and applications.

See Electric Welding, under MARINE AND NAVAL ENGINEERING.

Winches

Electric Cargo Winches (84176 A). E. F. Whitney. Ills. 8 pp. Gen Elec Rev—Feb., 1918. Equipment for applying electric drive.

Winding

Electric Winding (82134 A). D. Burns. 2500 w. Elec'n—Oct. 12, 1917. (Slightly abbreviated.) The problem of electric shaft winding; illustrated by example.

Winding Engines

Electric Winding Engines (86131 A). John F. Perry. 3000 w. Elec'n—April 5, 1918. Describes chief systems and discusses their merits as compared with steam methods.

Electric Winding Engines (84468 A). John F. Perry. Ills. 6500 w. Ir & Cl Trds Rev—Feb. 1, 1918. A comparison of various systems and some aspects of the problem in the event of centralization.

Woodworking

Motor Drive for Woodworking Machinery (88109). C. E. Clewell. Ills. 2200 w. Elec Wld—Aug. 10, 1918. Examples of successful motor applications.

TRANSFORMERS

Banking

Banking of Distribution Transformers (86915). P. O. Reyneau and H. Cole. 1500 w. Elec Rev, Chi—June 8, 1918. Fundamental considerations of arrangement involving economy and quality of service.

Shall Transformers Be Banked in a Distributing System? (85191). M. E. Grah. Diagrams. 2000 w. Elec Rev, Chi—March 23, 1918. Effect of banking upon investment, economy and service; precautions, etc.

Capacity

Increasing Transformer Capacity by Circulating Oil (85007). Claude H. Shepherd. Ills. 1200 w. Elec Wld—March 16, 1918. Installation of oil-circulating system at cost of \$700 increased permissible loads 60 per cent.

Connections

Phenomena Accompanying Transmission with Some Types of Star Transformer Connections—II (82948

D). Lloyd N. Robinson. 30 pp. A I E E, Pro—Dec., 1917. Second paper.

Construction

Some Details of Construction of Large Transformers by the British Westinghouse Co. (82485 A). Ills. 1000 w. Elec'n—Nov. 2, 1917. Serial, 1st part. Detailed descriptions.

Cooling

Methods of Cooling Transformers (83192). Arthur Palme. Ills. 3000 w. Power—Dec. 25, 1917. Different types of transformer tanks are discussed.

Current-Transformers

Current-Transformer Connections (85971). W. R. Woodward. Ills. 1600 w. Power—Apr. 30, 1918. Describes two types of construction, and discusses the reverse "V" and the star connections.

Design

Minimum-Cost Method of Transformer Design (82220). B. C. Dennison. Ills. 2000 w. Elec Wld—Nov. 3, 1917. First of two articles applying the

Fuses

method worked out to shell, core, and multiple magnetic circuit-type transformers with uniform and non-uniform flux density.

Fuses

Assuring Satisfactory Fuse Operation (85578). Ills. 2000 w. Elec Wld—April 13, 1918. Proper installation and renewal of transformer fuses are essential to good service and the protection of apparatus.

High-Voltage

High-Voltage Transformers at Alfkärleby (84023 A). Ills. 1200 w. Engng—Jan. 11, 1918. Voltage of 77,000 for hydro-electric power station in Sweden.

Indicator

Temperature Indicator for Transformer Winding (86756 A). V. M. Montsinger and A. T. Childs. Ills. 3000 w. Gen Elec Rev—June, 1918. Proposed schemes, and benefits derived, with details of a recently developed indicator.

Inspection

Transformer Inspection as Economic Measure (85949). Ills. 4000 w. Elec Wld—Apr. 25, 1918. Methods of caring for apparatus and detecting flaws.

Outdoor Transformers

Outdoor Water-Cooled Transformers (88063). R. von Fabrice. Ills. 1000 w. Power—Aug. 6, 1918. Necessary equipment to properly handle the oil and to furnish a suitable cooling-water supply.

TRANSMISSION AND DISTRIBUTION**Cables****Protection**

Some Phases of Protecting Distributing Transformers (84057). S. F. Erickson. Ills. 4500 w. Elec Rev, Chi—Feb. 2, 1918. Factors involved in conserving transformer life and capacity.

Radiator Type

Radiator Tank Transformers (87966 A). H. O. Stephens and A. Palme. Ills. 1200 w. Gen Elec Rev—Aug., 1918. Describes the construction of some of the latest forms.

Standardization

The Standardization of Transformers (84655 A). G. Stern, in Electrotech Zeit. (Abstract.) 1700 w. Elecn—Feb. 8, 1918. Points to be considered. Practice in Germany and in the United States.

Testing

Simple Method of Testing Current Transformers (83708). 1200 w. Elec Rev, Chi—Jan. 19, 1918. Outline of tests by which laboratory equipment may be dispensed with.

Test Ring Method

Current Transformer Ratio and Phase Error by Test Ring Method (88009 D). H. S. Baker. Ills. 2500 w. A I E E, Pro—Sept., 1918. Detailed description of apparatus and method of testing.

Voltage

Characteristics of Current Transformers on Open Circuit (84128 A). W. R. Woodward. 1800 w. Elec JI—Feb., 1918. Explains operation and the dangers.

TRANSMISSION AND DISTRIBUTION**A. C. Circuits**

Propagation Sur Une Ligne A Circuit Ouvert (82698 D). E. Brylinski. 7000 w. Bul Soc Internationale Des Electriciens—Aug.-Sept.-Oct., 1917. Mathematical treatment of the propagation of alternating current on closing circuits of various kinds.

A. C.-D. C.

Converting Alternating Current Into Direct Current (87433 A). Ills. 1500 w. Ry Loc Eng—July, 1918. Explains the three different methods.

Bus-Bars

Current Capacity of Copper Bus-Bars (84761 A). F. M. Billhimer. 1500 w. Elec JI—March, 1918. Factors which influence the energy loss in direct and alternating-current conductors.

Belgium

La Reconstitution De La Belgique (80079 B). J. Carlier. 3000 w. Génie Civil—Aug. 10, 1918. Plan to coördinate and centralize entire output of electric central stations.

Bus Work

The Utilization of Pipe for Outdoor Bus Work (83256). M. M. Samuels. Ills. 350 w. Elec Wld—Dec. 29, 1917. Charts giving deflections of copper, brass and iron pipe with and without ice load designed for high-tension apparatus.

Cables

Detective and Protective Devices for Electric Cables (88619 A). Ills. 700 w. Engr—Aug. 9, 1918. Describes a test sheath cable and a special "protective" system devised which is a combination of leakage and core balance protection, combined with detective arrangements and alarm devices.

The Test Sheath Cable and Its Potentialities (87913 A). Ills. 2000 w. Elec'n—July 5, 1918. Outline of lecture by C. J. Beaver at Trafford Park.

Copper Wires and Cables (82177). J. J. Keyes. 3500 w. Elec JI—Nov., 1917. Physical and electrical characteristics.

Circuit Breakers TRANSMISSION AND DISTRIBUTION Earth Connections

methods of stranding, tests on insulated wires and cables, etc.

Joint Boxes and Terminals for Split Conductor Cables (83741). Ills. 1200 w. Elec Rev—Jan. 4, 1918. Details of the Merz-Hunter protective system.

Aerial Cable Construction for Electric Power Transmission (86949 D). E. B. Meyer. Ills. 10 pp. A I E E, Pro—June, 1918. Problem of supplying high-tension electric service where conditions do not permit the use of open wire or underground circuits.

Duct Splicing Saves Short Lengths of Cable (86789). J. B. Noe and A. Rabe. Ills. 1200 w. Elec Wld—June 8, 1918. How splice diameter is minimized.

Cable Fault Localization in Practice (84134 A). D. M. W. Hutchison. Ills. 1400 w. Elec Rev—Jan. 18, 1918. Results of experience. Loop test with a special bridge, and a fall potential test.

Increasing Carrying Capacity of Underground Cable (85214). E. O. Schweitzer. Ills. 1200 w. Elec Wld—March 23, 1918. Benefits from substituting crude vaseline for air in ducts.

Circuit Breakers

High-speed Circuit Breakers for Chicago, Milwaukee & St. Paul Electrification (88680 A). C. H. Hill. 1000 w. Gen Elec Rev—Sept., 1918. Details of construction of unusual equipment.

Rating and Selection of Oil Circuit Breakers (84378 D). E. M. Hewlett, J. M. Mahoney, and G. A. Burnham. Ills. 16 pp. A I E E, Pro—Feb., 1918. Discusses the interpretations of the A I E E Standardization Rules, and factors involved in selection.

Circuits

Fundamental Relations Between Direct- and Alternating-Current Circuits (89651). Terrell Croft. Ills. 2000 w. Cl Age—Oct. 24, 1918. Deals with theory.

Concrete Poles

Concrete Poles Are in the Process of Evolution (86881). Charles Rufus Harte. Ills. 2200 w. Elec Ry JI—June 15, 1918. Merits and developments.

Condensers

Static Condensers (87969 A). W. B. Taylor. Ills. 2000 w. Gen Elec Rev—Aug., 1918. Shows the improvement in service that may be effected by use of static condensers on circuits of low power-factor.

Conductors

Characteristics of Iron and Steel Conductors (87821). Charles E. Oakes and P. A. B. Sahm. 1200 w. Elec Wld—July 27, 1918. Serial, 1st part. Use stim-

ulated by war emergencies. Test data for calculating electrical characteristics.

Investigation of Heating of Conductors (88821). Henry C. Horstman and Victor Tousley. 800 w. Elec Wld—Sept. 14, 1918. Serial, 1st part. Evidence indicates that rating should be modified to permit use of smaller conductors where the load is intermittent.

Conductors

Effects of Unsymmetrically Spaced Conductors (82879). George S. Humphrey. Ills. 3000 w. Elec Wld—Dec. loads and unsymmetrical spacing of conductors on the voltage drop in distribution lines.

Conduits

A Few Facts About Conduit Fishing (88531). Terrell Croft. Ills. 1000 w. Elec Rev, Chi—Aug. 24, 1918. Serial, 1st part. Discusses methods and equipment.

Some Comments on Conduit Benders (85964). Terrell Croft. Ills. 700 w. Elec Rev, Chi—Apr. 27, 1918. Serial, 1st part. Describes types and comments on their use.

Copper Resistance

The Standard Resistance and Temperature Coefficient of Pure Annealed Copper (86829 A). H. Savage. 1500 w. Elec Rev—May 24, 1918. Directions for calculating the resistance of electrical conductors.

Copper Wire

Economical Use of Copper (86788). P. O. Reyneau. 2000 w. Elec Wld—June 8, 1918. Shows that not enough attention is given to the removal of wire not effective in distribution systems.

Corona Tests

Corona Tests at High Altitude (82947 D). B. F. Jakobsen. 17 pp. A I E E, Pro—Dec., 1917. Tests made in Peru on a 70-mile transmission line located at an average altitude of 13,500 feet. The voltages range from 40,000 to about 72,000.

Drop Curves

Pressure Drop Curves for Copper Overhead Lines (82828 A). G. N. Wright. 1000 w. Engng—Nov. 9, 1917. Read before the Instn. of Elec. Engrs. Explanatory note for finding the true pressure drop.

Earth Connections

Power-Station Earth Connections (87424). P. H. Adams. Ills. 1500 w. Power—July 9, 1918. Proper method of putting down earth connections for electrical equipment.

TRANSMISSION AND DISTRIBUTION Industrial Plants

Earthing

Earthing Electrical Services in Mines (87902 A). 2500 w. Colly Gdn—July 12, 1918. Care needed for safety; the ideal earth.

The Development of an Efficient Earthing System (86383 A). J. P. Forster. construction now used.

Read before Assn. of Min., Elec. Engrs. Ills. 6000 w. Ir & Cl Trds Rev—March 29, 1918. Experiences in the earthing of a large electrical system feeding a group of mine collieries.

Electrical Supply

Some Transient Phenomena in Electrical Supply Systems (89049 N). E. W. Marchant, with bibliography and discussions. 28 pp. Instn E E, JI—July, 1918. Gives oscillograms, explaining results, etc.

Extension Problems

Service Extension Problems in California (82878). James F. Pollard. 2500 w. Elec Wld—Dec. 8, 1917. Electric utility management. Policy in California.

Faults

Some Notes on Loop Tests for Fault Localization (86827 A). G. W. Stubblings. 1200 w. Elec'n—May 17, 1918. Describes tests and apparatus used.

Feeders

The Calculation of Single-Phase and Three-Phase Lines (89526 A). J. R. Dick. 1500 w. Elec'n—Sept. 20, 1918. Serial, 1st part. From forthcoming new edition of "Electric Mains and Distributing Systems." Mathematical.

Flashing

Protection from Flashing for Direct Current Apparatus (87451 A). J. J. Linebaugh and J. L. Burnham. Ills. 4500 w. Gen Elec Rev—July, 1918. Investigation of some of the most promising suggestions.

Frequencies

The Technical Story of the Frequencies (83341 D). B. G. Lamme. 1200 w. A I E E, Pro—Jan., 1918. Shows that the choice of frequency has mainly been based upon service conditions at the time.

Fuses

The Development of 2,500-Volt Fuses (88646). Robert Charles Cole. 2200 w. Elec Wld—Sept. 7, 1918. Experimental investigations leading to the development of a fuse for high-power short circuits.

Open and Enclosed Type Fuses (82280 A). A. B. Eason. Abstract of paper in the P. O. Elec. Engrs. JI. 3500 w. Elec'n—Oct. 19, 1917. Discusses merits and summarizes investigations relating to their testing and standardization.

Germany

Les Nouveaux Matériaux Dans L'Industrie Electrique (87735 B). S. Frid. 3000 w. L'Industrie Electrique—June 25, 1918. Substitutes for copper in electric installations in Germany.

See same heading under Generating Station Connections

Ground Connections for Electrical Systems (87557 A). O. S. Peters, with bibliography. 220 pp. U S Bur Stds, No. 108—June 20, 1918. Available information concerning ground connections and their uses.

Practical Electrical Hints (87264). Terrell Croft. Ills. 2200 w. Natl Engr—July, 1918. Grounding transformer secondaries; knife-switch terminology; wiring calculations chart; splicing armature conductors, etc.

High-Tension Lines

Charging Currents and Earthing Devices in Transmission Lines (88839 A). H. Behrend. Abstract of an article in *Elektro. Zeit.* Diagrams. 2000 w. Elec'n—July 12, 1918. Special protective devices.

High Tension

Phasing Out High-Tension Lines Having Step-Up and Step-Down Transformers (82176). E. C. Stone. 2000 w. Elec JI—Nov., 1917. Method of testing the polarity and phase relations of lines to be paralleled.

Holland

Het Schakelstation van de Gemeentelijke Electricche Bedrijven te Enschede (83315 B). A. Lengton. 2700 w. Ingenieur—Nov. 17, 1917. Substation interconnected with distribution system in Northern Holland.

Increased Loads

Adapting Existing Lines to Increased Loads (83481). Ills. E. B. Hook, Jr. 1500 w. Elec Wld—Jan. 5, 1918. Method of reinsulating line while alive; out-door substation built from equipment taken from other stations, etc.

Induction

Inductive Effects of Alternating Current Railroads on Communication Circuits (88217 D). H. S. Warren. 30 pp. A I E E, Pro—Aug., 1918. Inductive interference in general and that due to electrified railroads, and means of preventing the trouble.

Industrial Plants

Standardized Flexible Distributing Systems in Industrial Plants (84772 A). Bassett Jones. Read at meeting of Schenectady Sec. of A. I. E. E. 7500 w. Gen Elec Rev—March, 1918. Serial, 1st part. A system for determining the power requirements of industrial plants in advance of construction.

TRANSMISSION AND DISTRIBUTION Lightning Arresters

Insulation

Pin or Arm Insulation Not Sufficient (88537). Ills. 2200 w. Elec Wld—Aug. 31, 1918. Placing dependence on it on high-voltage lines, especially where subjected to salt air, may cause charring due to leakage. Some remedies suggested.

Insulation Under Direct and Alternating Current, Particularly as Regards Moisture (84666 A). Prof. Thornton. Address before N. of Eng. Br. of Assn. of Min. Elec. Engrs. Ills. 1200 w. Ir & Cl Trds Rev—Feb. 8, 1918. The electrical structure of matter, residual charge, breakdown voltage and frequency, etc.

Electrical Properties of Vulcanized Fiber (83857). William Eves, 3d. 2000 w. Elec Wld—Jan. 26, 1918. Effect exerted by color, thickness and temperature on the breakdown value. Results of tests.

Apparent Dielectric Strength of Var-nished Cambric (82993). A. E. Ken-nelly and R. J. Wiseman. 2500 w. Elec Wld—Dec. 15, 1917. Investiga-tions of dielectric strength with multiple electrodes; necessity of standardizing size of test electrodes.

Insulators

Application of Theory and Practise to the Design of Transmission Line In-sulators (86950 D). G. I. Gilcrest. Ills. 20 pp. A I E E, Pro—June, 1918. Considers old types of insulators and causes of failures; describes proposed type and its advantages.

Electrical Porcelain (84125 A). G. I. Gilcrest and T. A. Klinefelter. Ills. 3500 w. Elec JI—Feb., 1918. How a satis-factory product has been developed.

Factors Affecting Selection of Insu-lators (82342). A. O. Austin. Ills. 3500 w. Elec Wld—Nov. 10, 1917. Lia-bility to interruption dependent on size of system; steel structures impose greater strains than wood; nature of load.

Factors Affecting Selection of Insu-lators (83255). A. O. Austin. Ills. 2000 w. Elec Wld—Dec. 29, 1917. Advan-tages and disadvantages of ground wire, local conditions, etc.

Interconnection

New England—Boston Power Intercon-nection (89177). Map. 2000 w. Elec Wld—Sept. 28, 1918. Transmission line between the two large systems will in-sure 20,000 kw. for war industries.

New England Interconnection Plan Takes Shape (88110). Map and plans. 2000 w. Elec Wld—Aug. 10, 1918. Serial, 1st part. Deals particularly with south-

eastern Massachusetts. Propose duplicate line from Boston to Fall River.

Benefits Possible from Interconnec-tion (86784). Ills. 1600 w. Elec Wld—June 8, 1918. Analysis of conditions in Eastern Massachusetts, and the possi-bilities.

Linking Up Rural Communities in Iowa (85489). Ills. & Map. 2000 w. Elec Rev, Chi—April 6, 1918. Transmission line economies and centralized generation sup-plies scattered settlements.

Operation of Interconnected Systems (86335). J. P. Jollyman. Ills. & Map. 1200 w. Elec Wld—May 18, 1918. Ex-periences in connection with one of the most extensive inter connected networks.

Interior Wiring

Importance to Public of Inspection of Interior Wiring (89674). William S. Boyd. 2200 w. Elec Rev, Chi—Oct. 26, 1918. Serial, 1st part. Discusses need for electrical inspection.

Insuring Against Disagreements Over Wiring (89612). Ills. 1800 w. Elec Wld—Oct. 19, 1918. Service code established by Bridgeport (Conn.) utility.

Iron Lines

Resistance and Reactance of Iron Trans-mission Lines (88382 A). A. Press. 1800 w. Elec'n—July 26, 1918. A new math-ematical operator method.

Iron Wire

Ueber die Verwendbarkeit eiserner Fahrleitungen für Wechselstrombahnen (84584 B). W. Kummer. 2800 w. Schweizerische Bauzeitung—Dec. 22, 1917. The use of iron wire overhead conductors for alternating current railways.

Lightning Arresters

Self-restoring Properties of Lightning Arresters (87450 A). H. G. Brinton. Ills. 2500 w. Gen Elec Rev—July, 1918. Describes the self-restoring properties of the more common types.

Selecting Lightning Arrester Types to Suit Requirements (86886). Q. A. Brackett. Ills. 1700 w. Elec Ry JI—June 15, 1918. Applicability of electro-lytic, multipath, and condenser types to several classes of service; suggestions for installation and maintenance.

The Oxide Film Lightning Arrester (86947 D). Crosby Field. Ills. 10 pp. A I E E, Pro—June, 1918. Statement of the scientific principles of a new type.

The Oxide Film Lightning Arrester (86948 D). Charles P. Steinmetz. Ills. 9 pp. A I E E, Pro—June, 1918. De-velopment of lightning arresters re-viewed and a description given.

Direct Current Aluminum Lightning Arrester (82268 A). V. E. Goodwin.

Lighting Protection TRANSMISSION AND DISTRIBUTION Pole-Line Costs

Ills. 900 w. Gen Elec Rev—Nov., 1917. Principal application in the protection of street railway equipment.

Lightning Arrester Spark Gaps (86418 D). Chester T. Allcutt. Ills. 20 pp. A I E E, Pro—May, 1918. Describes a new form of high-voltage lightning arrester gap. Results of tests are highly favorable.

Les Nouvelles Normes Relatives à l'installation des Partonnerres (86468 B). 3800 w. Schweiz Elektrotech Verein Bul—Mar., 1918. New standards for installation and maintenance of lightning conductors on buildings adopted by Swiss Association of Electrical Engineers.

Lightning Protection

Lightning Protection for Special Transmission Lines (86749 A). G. C. Dill. Ills. 1200 w. Elec J1—June, 1918. Applications of lightning protection apparatus, especially of electrolytic lightning arresters.

Line Calculations

Simplifying Transmission Line Calculations (84062). T. A. Wilkinson. 2500 w. Elec Wld—Feb. 2, 1918. Method involving new equations and chart based on rigorous formula.

Line Construction

Transmission-Line Construction of Duquesne Light Company (86772). Thomas R. Hay. Ills. 1800 w. Elec Rev, Chi—Oct. 26, 1918. Account of difficulties met in building a 66,000-volt line through a mountainous region.

Standardization of Overhead Construction (85948). H. E. Wulfig. Ills. 1700 w. Elec Wld—Apr. 27, 1918. Considerations that determined the types of line construction now used.

Line Materials

Utilization of Second-Hand Line Materials (84801). L. M. Klauber. Ills. 3500 w. Elec Wld—March 9, 1918. Methods of effecting economies in line construction.

Lines

Special Transmission-Line Problems (86066). Ills. 2500 w. Elec Wld—May 4, 1918. How some difficulties peculiar to long spans have been overcome.

Iron Wire for Transmission Lines (85963). W. T. Ryan. 1500 w. Elec Rev, Chi—Apr. 27, 1918. Relative advantages of iron and copper.

Construction Details of 66000-Volt Line (83031). Ills. 1500 w. Elec Rev, Chi—Dec. 15, 1917. Unusual conditions in building Wheeling-Moundsville line.

Line Sag

Sag Calculation for Iron-Wire Lines (87985). M. D. Leslie. 1500 w. Elec

Wld—Aug. 3, 1918. Suggests stringing lines with less sag as a war-economy, when conditions warrant.

Sag-Temperature Calculations of Transmission Lines on Steep Grades (85724 B). Alfred Still. Ills. 1500 w. Fkn Inst, J1—April, 1918. Recommended procedure.

Load Centers

Determining of Load Centers of Circuits (86231). Terrell Croft. Ills. 1200 w. Power—May 14, 1918. Explains the location of load centers of electric circuits.

Long Spans

High Voltage Transmission Line Has Mile Span (85217). Romeo Morrisette. Ills. 700 w. Can Engr—March 21, 1918. Overhead power cables under 100,000 volts pressure to cross the St. Lawrence River.

Losses

Economy in Electrical Distribution (88,278). W. B. Stetznier. 2500 w. Elec Wld—Aug. 17, 1918. Investigation of losses for the purpose of improving the service at minimum expense.

M-Phase Systems

Harmonics in Symmetrical M-Phase Systems (85338). V. Karafeltoff. 2500 w. Elec Wld—March 30, 1918. Read before Am. Assn. for Adv. of Sci. Conditions which can exist in star-connected or mesh-connected systems having any number of phases.

Networks

Method of Symmetrical Co-ordinates Applied to the Solution of Polyphase Networks (86953 D). C. L. Fortescue. 87 pp. A I E E, Pro—June, 1918. Mathematical.

Oil Switches

Die Untersuchungen an Oelschaltern (84585 B). B. Bauer. Ills. 12,000 w. Bulletin Schweizerischer Elektrotechnischer Verein—Oct., 1917. Report of committee on high tension apparatus. Thermodynamics of oil switches.

Tests on Oil Switches (85422 A). Bruno Bauer. 3500 w. Elec'n—March 15, 1918. Abstract of fourth report of the Commission on High-Tension Apparatus and Fire Protection. Deals with the thermodynamic and chemical processes involved.

Overcharged Wires

Court Decisions on Accidents from Overcharged Service Wires (86553). Chelsea C. Sherlock. 1800 w. Elec Rev, Chi—May 25, 1918. Resume of several important cases.

Pole-Line Costs

Studies in Wood, Steel and Concrete Pole-Line Costs (85490). F. L. Haushalter. 2500 w. Elec Rev, Chi—April 6, 1918. Serial. 1st part. Comparative costs.

Pole Lines TRANSMISSION AND DISTRIBUTION River Crossing

Advantages of preservative treatment for wood poles. Factors affecting cost.

Pole Lines

The Forces Which Act Upon a Transmission Line (84457). Charles R. Harte. Ills. 3000 w. Elec Ry J1—Feb. 23, 1918. Means of calculating the factor of safety.

The Mechanics of the Pole Lines (84-295). Ward H. Snook. Ills. 2000 w. Telephony—Feb. 16, 1918. Serial, 1st part. Determination of forces acting on pole lines by use of graphics.

Pole Numbering

Numbering of Pole Line Structures (89295). Ills. 1500 w. Elec Rev, Chi—Oct. 5, 1918. Comparison of various methods of numbering poles.

Poles

Substitutes for Cedar Poles (86236 A). L. M. Klauber. Ills. 1800 w. Tel Engr—May, 1918. Part of the report of the Engineering Committee for the Pacific Coast section, N. E. L. A.

Getting the Right Wood Poles for Electric Railway Service (85771). Charles R. Harte. Ills. 4500 w. Elec Ry J1—April 20, 1918. Characteristics of available woods analyzed and specifications for pole purchase given.

Portable Switchboards

Transportable Isolier-Schutzwände für Hochspannungs-Schaltanlagen (84586 B). E. Sieber. Ills. 1000 w. Bul-Schweiz. Elektrotechnischer Verein—Nov., 1917. Portable switchboards and compartments for high tension apparatus.

Power Control

The Control of Large Amounts of Power (85091 N). E. B. Wedmore. Ills. 24 pp. Instn E E—March 7, 1918. Considers probable developments of the immediate future, and how conditions may be dealt with.

Power Factor

Etude Des Dispositions A Employer Pour Améliorer Le Facteur De Puissance (85100 D). M. Rechniewski. 2200 w. Bul Soc Internationale Des Electriciens—Jan., 1918. Study of the best methods of improving the power factor on distribution lines.

Some Fundamental Considerations of Power Factor Correction (85713 N). R. A. McCarthy, with discussion. 4500 w. Assn I S E E—Jan., 1918. Things that affect power factor and how corrected.

Some Fundamental Considerations of Power Factor Correction (85713 N). R. A. McCarthy, with discussion. 4500 w. Assn I S E E—Jan., 1918. Things that affect power factor and how corrected.

Power Lines

Long Spans Facilitate Mountain Service (87063). N. B. Hinson. Ills. 1000 w. Elec Wld—June 22, 1918. Features of construction of power lines.

Power Transmission

The Transmission of Power (87912 A). B. Welbourn. 6000 w. Elec'n—June 28, 1918. Considerations which must affect the choice between underground cables or overhead lines. Gives costs of five schemes.

Phase Rotation

Phase Rotation in Relation to Unbalanced Three-Phase Distributing Systems (84906 B). Herbert B. Dwight. 1500 w. Univ Col J1 Eng—Jan., 1918. Problem and solution.

Reactance

Reactance and Short-circuit Current (87968 A). R. E. Doherty. Ills. 800 w. Gen Elec Rev—Aug., 1918. Explains the inter-relationship.

Rectifiers

Factors Affecting Vapor-Rectifier Performance (84463). William Tschudy. Wave forms. 1000 w. Elec Wld—Feb. 23, 1918. Bulb losses greatly dependent on wave form, frequency and anode current.

Regulators

The Voltage Regulator and Phase-balancer Regulator Equipment of the Philadelphia Electric Company (84774 A). R. M. Carothers. Ills. 1500 w. Gen Elec Rev—March, 1918. Installed to distribute over the three phases of the generators a heavy single-phase railway load.

Voltage Regulation of Three-Phase Feeders by Automatically Controlled Induction Regulators (84775 A). M. Unger. Ills. 3500 w. Gen Elec Rev—March, 1918. Regulation by one 3-phase automatic induction regulator.

Relays

Time Limit Induction Overload Relay (89440 A). F. E. Jaquay. Ills. 900 w. Gen Elec Rev—Oct., 1918. Built on principle of induction type meters. Descriptive.

Relay Operation on Heavy Short-Circuits (82180). L. N. Crichton. Ills. 1400 w. Elec J1—Nov., 1917. An analysis of tests made by the Alabama Power Co.

Recent Protective Relay Developments (86752 A). E. A. Hester. Ills. 3500 w. Elec J1—June, 1918. Relays furnishing protection against overheating, power reversal and phase reversal.

River Crossing

An Interesting Transmission Line River Crossing (84056). Ills. 1500 w. Elec

Secondary Network TRANSMISSION AND DISTRIBUTION Wire Sizes

Rev, Chi—Feb. 2, 1918. Features of project of the Toledo Railway & Light Co. Long span over Maumee River.

Secondary Networks

Successful Operation of Secondary Networks (83859). S. Bingham Hood. 2500 w. Elec Wld—Jan. 26, 1918. Discusses important points.

Service Connections

Providing Underground Service Connections Economically (82772). Edward B. Meyer. Ills. 2500 w. Elec Rev, Chi—Dec. 1, 1917.

Service Installations

Overhead and Underground Service Installations (82212). Edward B. Meyer. Ills. 3300 w. Elec Rev, Chi—Nov. 3, 1917. Review of present practice with the idea of relieving the streets, as far as possible, of overhead wires.

Short Circuits

The Suppression of Arcs Due to Accidental Grounds (83580 A). M. H. Collbohm. 3000 w. Elec JI—Jan., 1918. Methods of providing for grounded circuit conditions; distinguishing features of these equipments.

Split-Conductors

Split-Conductor Cables—Balanced Protection (87684 D). Ills. 28 pp. A I E E, Pro—July, 1918. Experiences of the Edison Electric Illuminating Co. of Boston in the design and application of selective balanced-protection schemes to parallel connected transmission conductors.

Steel Circuits

Steel Conductors for Series Circuits (87005). L. M. Klauber. 2000 w. Elec Wld—June 22, 1918. Facts that determine the choice between steel and copper; formula and application.

Supply Schemes

Small Generating Stations and Electricity, Supply Schemes (86699 N). R. F. Botting, with discussion. 6500 w. So Af Instn Elec Engrs, Trans—March, 1918. Refers chiefly to municipal schemes for the supply of electricity for lighting and power in small towns.

Switchboards

See same heading under Generating Stations.

Switchgear

Switchgear Standardization (85076 N). Charles C. Garrard. Ills. 14 pp. Instn E E—Feb. 21, 1918. General principles underlying standardization, discussing matters in connection.

Switching

The Design of Automatic Switching Equipments (85409 A). R. J. Wensley.

Ills. 4500 w. Elec JI—April, 1918. Desirable features; a typical installation.

Safety Features in Switching Apparatus (85337). M. M. Samuels and F. N. Bechoff. Diagrams. 3000 w. Elec Wld—March 30, 1918. Ideas for designing or remodeling switching installations.

The Tendency Toward Outdoor Switching Apparatus (85411 A). H. G. MacDonald. Ills. 2200 w. Elec JI—April, 1918. Shows economy effected, etc.

Safety Features in Switching Installations (86529). M. M. Samuels and F. N. Bechoff. 2000 w. Elec Wld—May 25, 1918. Recommendations.

Synchronous Condensers

Improving Power Factor and Voltage Regulation (88822). J. T. Peyton. Ills. 1500 w. Elec Wld—Sept. 14, 1918. By using synchronous condensers Pennsylvania Co. has met increased demands.

Synchronizing

Synchronizing Stations to Reduce Interruptions (84214). Ills. 1200 w. Elec Wld—Feb. 9, 1918. Flexibility of operation increased by installing two synchronizing stations.

Three-Phase

Operating Features of Three-Phase Four-Wire Distribution (85776). George E. Wagner. 3300 w. Elec Rev, Chi—April 20, 1918. The economies, advantages and precautions accompanying distribution.

Transposition Systems

The Design of Transpositions for Parallel Power and Telephone Circuits (87682 D). Harold S. Osborne. 40 pp. A I E E, Pro—July, 1918. Results obtained in a recent design outlining methods used and the theory upon which the work is based.

Design of Transpositions for Parallel Power and Telephone Circuits (89281 A). Harold S. Osborne. 3000 w. Tel Engr—Oct., 1918. Serial, 1st part. Results obtained in a recent design of transposition systems for telephone circuits exposed to induction from other circuits.

Underground

Design of Underground Distribution for Electric Light and Power Systems (84769 D). G. J. Newton. Ills. 50 pp. A I E E, Pro—March, 1918. Shows each step necessary in the design of a system for a medium size city.

Interesting Underground Distributing System at Astoria, Oregon (86200). Ills. 1200 w. Elec Rev, Chi—May 11, 1918. Details of convenient routing of gas, telephone and electric systems.

Wire Sizes

Methods of Determining Economical Feeder Sizes (82994). P. O. Reyneau.

Wiring

2500 w. Elec Wld—Dec. 15, 1917. Equations developed and curves plotted to illustrate how most economical size of wire may be determined.

Wiring

Electric Wiring in Workshops (83089 A). F. Ashton. 1800 w. Mech Wld—

MISCELLANY**War Service**

Nov. 30, 1917. Serial, 1st part. Suggestions for wiring to meet severe conditions.

Best Practice in Service and Metering (83592). Edward B. Meyer. Ills. 2500 w. Elec Rev, Chi—Jan. 12, 1918. Precautions; advantages of full iron-clad wiring.

MISCELLANY**Conservation**

War Conservation of Power and Light (86783). Charles E. Stuart. 3500 w. Elec Wld—June 8, 1918. General plans laid out by the Bureau of Conservation of the U. S. Fuel Administration.

Electrical Campaign

California's Electrical Coöperative Campaign (87823). S. M. Kennedy. 3000 w. Elec Wld—July 27, 1918. Outlines the first year's activities for the purpose of developing maximum intelligent distribution of electrical goods.

Electrical Dealers

Practical Suggestions for the Electrical Dealer (87636). M. V. Rutherford. Ills. 2000 w. Elec Rev, Chi—July 13, 1918. Details requiring attention.

Publicity Problem of Electrical Dealer (87638). Chester A. Gauss. 3000 w. Elec Rev, Chi—July 13, 1918. Serial, 1st part. How competition may be met.

Results of Goodwin Plan in Contractor-Dealer Field (87637). W. A. Scott. 3500 w. Elec Rev, Chi—July 13, 1918. Results during the first year and the future outlook.

Electrical Industries

Die elektrotechnische Weltindustrie während des Krieges und die zukünftigen Absatzverhältnisse (85102 B). P. Gurewitsch. 5000 w. Bul Schweiz Elektrotechnischer Verein—Jan., 1918. The world's electrical industries in war time and future outlook in Switzerland.

Electrical Industry

Some Developments in the Electrical Industry During 1917 (83617 A). John Liston. Ills. 49 pp. Gen Elec Rev—Jan., 1918. Review of activities during the past year.

A Review and Forecast of the Electrical Industry (87965 A). E. W. Rice, Jr. Presidential address at Atlantic City, June, 1918. 4500 w. Gen Elec Rev—Aug., 1918. Phases of the industry which are of special significance.

Substitutes in the German Electrical Industry (85414 A). 3300 w. Engng—March 8, 1918. Information from address of M. T. Husberg before a meeting of Swedish Electricity Works.

Electrical Trades

The Electrical Trades After the War (87893 A). 4500 w. Engr—June 28, 1918. Excerpts from the report of a departmental committee appointed by the Board of Trade.

Electricity

Electrical Progress and Tendencies in 1917 (83513). Albert Scheible. 6500 w. Elec Rev, Chi—Jan. 5, 1918. Review of the year's advances.

Inst. E. E.

Inaugural Address (83609 N). C. H. Wordingham. 15000 w. Instn E E, JI—Dec., 1917. How far the Institution meets the needs of the profession and industry and what improvements are possible.

Institution of Electrical Engineers

Mr. C. H. Wordingham's Presidential Address to the Institution of Electrical Engineers (82834 A). 3300 w. Elec'n—Nov. 16, 1917. Serial, 1st part. (Abstract.) The present and future work of the Institution.

Italy

Electrical Developments in Italy (85244 A). E. Strachan Morgan. 1300 w. Elec Rev—March 8, 1918. Serial, 1st part. Interesting review of progress.

South Africa

The Association of Municipal Electrical Engineers (Union of South Africa) (82832 A). John Roberts. Presidential address. 3000 w. Elec'n—Nov. 16, 1917. Particularly South African industries and their development. Conditions due to war.

Progress

A Review of Electrical Engineering Progress (88215 D). E. W. Rice, Jr. President's address. 12 pp. A I E E, Pro—Aug., 1918. Matters of present interest and importance. Methods and devices adopted for improving efficiency and economy.

War Service

War Service of the Electrical Manufacturers (87066). Robert K. Sheppard. 1800 w. Elec Wld—June 22, 1918. From report of general war service committee of Electric Power Club.

INDUSTRIAL MANAGEMENT

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EDUCATION

Aptitude

Administration

Training in Industrial Administration
(88888 B). W. G. Cass. 3000 w. Cas
Eng Mthly—Aug., 1918. Reviews existing
facilities for study along this line, and
calls attention to a scheme proposed by
Northumberland Miners' Assn.

Agriculture

The Tutored Farmer (88188 A). W. O. Hedrick. 3000 w. Sci M—Aug., 1918. Activities for the instruction of farmers, and results.

L'Importance Économique De L'Enseignement Agricole (83929 C). H. M. Nagant. 4500 w. Revue Trimestrielle Canadienne—Nov., 1917. Economic importance of the study of agriculture.

Air Pilots

See MECHANICAL ENGINEERING, *Aeronautics*.

Aircraft Plant

See Training, under MECHANICAL ENGINEERING. *Aeronautics.*

Americanization

Americanization a Problem in Human Engineering (86871). Henry D. Hammond. 3800 w. Eng News-Rec—June 13, 1918. Needs of foreign labor. Urgency of the situation.

What Is Americanization? (87166 A).
500 w. Ind Man—July, 1918. Editorial
on opinions of Charles H. Paul as given
in a report for The Solvay Process Co.

Applied Science

What the Empire Owes to Applied Science (82376 A). 2200 w. Engr—Oct. 26, 1917. Developments at Hong Kong. Shipbuilding, public works, and other industries.

Apprentices

Fundamentals of Apprenticeships. National Interest Grows—I (87994). 4000 w. Can Fndman—July, 1918. Serial, 1st part. Requirements of industrial education.

The Education and Training of Engineering Apprentices (87973 A). P. H. S. Kempton. 1000 w. Elec Rev—July

19, 1918. Serial, 1st part. Account of some of the systems of training.

Apprenticeship Training—Including an Account of a Possible System of Continued Education for Engineering Apprentices (83840 N). A. P. M. Fleming. 34 pp. Instn E & S Scot, Trans—Dec., 1917. Principles and basic requirements.

The Training of Engineering Apprentices (83383 A). Addresses by A. E. Carter and by R. W. Bailey. (Slightly abridged.) 8000 w. Engng—Dec. 14, 1917. Recommendations of educators.

Report of the Committee on the Education of Apprentices. Also Report of Deputation to the Board of Education (84237 N). 30 pp. N E C Instn, Trans-Jan., 1918.

Apprenticeship

Apprenticeship and the War (88890 B).
E. T. Good. 1200 s. Cas Eng Mthly—
Aug., 1918. Movement to provide assist-
ance for discharged soldiers who desire
professional and business appointments.

Improved Appren-
the Pennsylvania (N
Ills. 2000 w. Ry
Latest development
enship Methods on
N). J. H. Yoder.
Engr—Jan., 1918.
the course.

Apprenticeship Training Schemes
(83071 A). 2200 w. Engng.—Nov. 30,
1917. Reviews paper by A. P. Fleming
to Instn. of Engrs & Shipbuilders in
Scotland, which gives an account of the
work at British Westinghouse Co.'s
Works.

Apprentissage (84598 C+D). M. **Préapprentissage** July. 11,000 w.
Bul Soc D'Encouragement Pour L'Indus-
trie Nationale—Nov. Dec., 1917. Appren-
ticeship and allied problems for workers.

Aptitude

The Indications of a Natural Aptitude for Mechanical Engineering (82412 A). Sanford A. Moss. 1500 w. Eng Ed—Oct., 1917. The signs that should decide in the selection of a career; theory as applied to the case of mechanical engineers.

Consult Classification of the Index. See page 9

EDUCATION

Safety

Ballistics

A Field Ballistic Problem (87185 B). 27 pp. U S Art, J1—Jan.-April, 1918. Aims to give artillery officers a working knowledge of the ballistic problems they are apt to encounter.

Boiler Rooms

Education of Boiler-Room Men Necessary (88353). Edwin A. Hunger. 3500 w. Elec Wld—Aug. 24, 1918. Importance of human element in fuel conservation.

Boys

See same heading under Welfare and Safety.

Business

Business Training at the Universities (87404 A). 2000 w. Engr—June 14, 1918. What has been done at Cambridge, Oxford, Leeds, Sheffield, Manchester, Birmingham, Liverpool, etc.

Catalogue

L'Avenir Du Catalogue International De La Littérature Scientifique (85140 B). P. Otlet. 4000 w. Revue Générale des Sciences—Feb. 15, 1918. Future aspect of an international catalogue.

Chemical Engineering

The School of Chemical Engineering Practice—A Year's Experience (82785 B). William H. Walker, with extracts from letters by members. 3000 w. J1 Ind & Eng Chem—Dec., 1917. Objects of the school.

Chemical Engineers

The Training and Work of the Chemical Engineer (84492 N). 58 pp. Faraday Soc, Trans—Dec., 1917. A general discussion introduced by Sir Robert Hadfield.

Chemistry

Het onderwijs in de chemische technologie aan de Technische Hoogeschool (89054 B). A. Steger. Ills. 5200 w. Instruction in chemical technology at Dutch Technical High School.

The Removal of the German Camouflage from Chemistry (88951). Townes R. Leigh. 5000 w. Mfrs Rec—Sept. 19, 1918. Showing how little Germany has really accomplished in original research and chemical discoveries.

L'Avenir De L'Industrie Chimique En France (83938 B). A. Kling. 4000 w. Le Génie Civil—Nov. 24, 1917. Future of industrial chemistry in France.

La Chimie Industrielle (83930 C). L. Bourgoignon and P. Le Cointe. 4000 w. Revue Trimestrielle Canadienne—Nov., 1917. Introductory lecture of a new course.

The Importance of Practical Chemistry (89432 B). G. W. Thompson. 1200 w. J1 Ind & Eng Chem—Oct., 1918. Its value

in peace and war. Its applications in the industries.

Chemists

The Work of the Chemical Section of the War Industries Board (89429 B). Charles H. Mac Dowell. 2500 w. J1 Ind & Eng Chem—Oct., 1918. Outlines the work accomplished.

The Place of the University in Chemical War Work (89431 B). E. W. Washburn. 3500 w. J1 Ind & Eng Chem—Oct., 1918. The training of chemists, and research on war problems.

The American Chemist in Warfare (89428 B). Charles L. Parsons. 6000 w. J1 Ind & Eng Chem—Oct., 1918. The marvelous chemical development since the war. Departments and bureaus utilizing chemists.

Coal Mining

Coal-Mining Instruction in the Evening Schools of Derbyshire and Leicestershire (87905 A). George Forster. 4000 w. Ir & Cl Trds Rev—July 12, 1918. Explains scheme of instruction.

Colliery Deputies

The Status and Training of Colliery Deputies (86403). J. W. McTrusty. Read before Natl Assn Col Mgrs. 6000 w. Ir & Cl Trds Rev—March 8, 1918. The position in the industry that deputies should occupy, and their training.

Colliery Managers

Examinations for Colliery Managers' Certificates of Competency (87885 A). 3000 w. Ir & Cl Trds Rev—May 31, 1918. Papers from Board for Mining Examinations, at the Home Office.

Discussion of Mr. G. L. Kerr's Paper on "The Higher Education of Colliery Managers (86318 N). 17 pp. Instn Min Engrs, Trans—April, 1918.

Corporation Schools

Activities of the National Association of Corporation Schools (84333 A). F. C. Henderschott, with discussion. 17 pp. N Y Rd Cb, Pro—Jan. 18, 1918. Training of apprentices.

Craftsmen

The Education of Skilled Craftsmen (83695 A). C. A. Otto. 1000 w. Mech Wld—Jan. 4, 1918. Suggestions.

Crippled Soldiers

The Crippled Soldier in Industry (85802 D). Frank B. Gilbreth, with discussion. 4200 w. A I M E, Bul—April, 1918. Investigates the opportunities for such labor and the re-education necessary.

See same heading under Welfare and Safety.

The Engineer, the Cripple and the New Education (83335 A). Frank B. Gilbreth and L. M. Gilbreth, with discussion. 7000

Disabled Men

w. A S M E, JI—Jan., 1918. Reviews progress in the solution of the problem of training cripples.

Disabled Men

The Vocational Re-education of Disabled Soldiers from the Mining Industry (88873 N). F. H. Sexton. 4800 w. Can Min Inst, Bul—Sept., 1918. Especially what is being done in Canada for men formerly employed in mining and metallurgical industries.

The Vocational Re-education of Disabled Men (88151). C. A. Prosser. 1200 w. West Eng—Aug., 1918. Plans of Federal Government for training disabled veterans.

Documentation

La Documentation Technique Et Industrielle (87140 B). General Sebret. 5600 w. Génie Civil—May 25, 1918. Serial, 1st part. General system of classifying and recording publications on technical and industrial topics.

Drawing Room

Training Women for the Drawing Room (87324 A). Howard W. Dunbar and W. E. Freeland. Ills. 2500 w. Iron Age—July 4, 1918. Successful methods employed by Norton Grinding Co. Teaching system and results.

Education Bill

Notes on the Education (Scotland) Bill (87085 N). William Jarvie, with short discussion. 3000 w. Instn Min Engrs, Trans—May, 1918. Details of the bill.

The Education Bill: Its Objects and Its Reference to Industry (82300 N). H. A. L. Fisher. Address at Manchester, Eng. 4000 w. Beama JI—Oct., 1917. Scheme to extend the facilities for public education in England.

Educational Reform

La Réforme De L'Éducation Nationale (86458 C + D). G. Hersent. 11,700 w. Bul Soc D'Encouragement Pour L'Industrie—Jan.-Feb., 1918. Suggestions for improving the system and methods of education in France.

Efficiency

Under New Management—A Man's Power (83948 A). Charles M. Horton. 3000 w. Ind Man—Feb., 1918. Possibilities of man's achievements.

Electrical Courses

Electrical Courses at the School of Engineering of Milwaukee (85192). Ills. 1800 w. Elec Rev, Chi—March 23, 1918. Methods used in teaching electrical theory and practice.

Les Industries De Houille Blanche (85118 B). M. Barbillion. Ills. 2000 w. La Nature—Feb. 9, 1918. Courses in elec-

EDUCATION**Engineering Instruction**

tric power applications at the University of Grenoble, France.

Electrical Employees

Methods of Education for Electrical Employees of Iron and Steel Mills (88913 N). 10 pp. Assn I S E E—Sept., 1918. Suggestions of the Educational Committee.

Employees

Responsibility of Employers to Their Employees in Patriotic and Educational Work (88950). 2000 w. Mfrs Rec—Sept. 19, 1918. Importance of educating the laboring people as to meaning of the war.

Education of Employers (87262). Walter N. Polakov. Address before N. A. S. E. of N. Y. City. Charts. 2500 w. Natl Engr—July, 1918. What every employer should know and practice.

Engineering Council: Its Progress and Aims (87574 A). Alfred D. Flinn. 8 pp. E Cb St L, JI—May-June, 1918. Service performed and its obligations.

Employment

War Emergency Courses in Employment Department Practice (85900 A). Roy Willmarth Kelly. 2000 w. Ind Man—May, 1918. Programme of intensive training in employment-department practice.

Engineering

Engineering: A Liberal Education (86289 A). Philip B. McDonald. 2500 w. Univ Col JI Eng—April, 1918. Value of an education in applied science.

Broader Foundation Demanded for Engineering Education (89131 A). Fred-eric Bass. 2000 w. Eng News-Rec—Sept. 26, 1918. Ways in which engineering education needs to be modified.

The National Engineering Societies and the National Research Council (89282 A). Dr. George Ellery Hale. 5500 w. A S M E, JI—Oct., 1918. Reviews the development of engineering in the United States.

Education Needed for Present Engineering Demands (89666). Ills. 4000 w. Elec Wld—Oct. 26, 1918. Abstract of Dr. C. R. Mann's report on his three-year study of engineering education.

Engineering Graduates

Engineering Graduates and Industrial Demands (82414 A). L. W. W. Morrow. 9 pp. Eng Ed—Oct., 1917. Reply to criticisms on present educational methods and engineering curriculums.

Engineering Problems

Universal Public Service in Peace and War (83325 A). Ira N. Hollis. 6000 w. A S M E, JI—Jan., 1918. Training needed; our weaknesses, etc.

Engineering Instruction

Special Education in Time of War (83327 A). Charles S. Howe. 2500 w.

Engineering Trade

A S M E, J1—Jan., 1918. Problems of engineering colleges. Efficient training. **Engineering Trades**

The Engineering Pupilage and the Engineering Trade Apprenticeship (84658 A). Algernon E. Berriman. 6000 w. Engng—Feb. 1, 1918. Refers particularly to systems in England for training of engineers.

Engineer Officers

The Battle of the Somme (85073 B). A. V. Gompertz. 24 pp. Prof Mem—March-April, 1918. Lecture delivered at the Officers Cadet Unit in India.

Sapping Operations, Especially for Infantry: From a Lecture to Cadets at Saint Maixant, France (85070 B). A. Gay. Ills. 15 pp. Prof Mem—March-April, 1918. Explanation and description of excavations.

Engineers

Engineers and the War (88218 D). William M. Black. 12 pp. A I E E, Pro—Aug., 1918. Nature of the work of the engineer and the preparation required.

The Training of Engineers (88148). E. J. Silcock. 3500 w. Can Engr—Aug. 8, 1918. Introduction to discussion by the Institution of Water Engineers, England.

Safety and Welfare Work in the Engineer's Education (87309 A). George H. Fellows. (Abstract.) Also discussion. 3000 w. A S M E, J1—June, 1918. Gives schedules adopted by the faculty of Carnegie Tech., and other information.

Army Engineer School in France Standardizes Work in the Field (87624). Robert K. Tomlin, Jr. Ills. 4000 w. Eng News-Rec—July 18, 1918. Serial, 1st part. Gives courses of training to men recommended for commissions.

Training Engineer Officers for the Army at Camp Lee (87312). Frank C. Wight. Ills. 2500 w. Eng News-Rec—July 4, 1918. Fitting men for over-sea service.

An Address to Graduating Student Engineers (86757 A). E. W. Rice, Jr. 4500 w. Gen Elec Rev—June, 1918. Importance of engineers in times of peace and war and the education desirable to meet requirements.

The Engineering Profession Fifty Years Hence (86861 A). J. A. L. Waddell. 4800 w. Sci M—June, 1918. Serial, 1st part. Account of the organization of the American Academy of Engineers, its aims and work.

Present-Day Conditions Are Forcing the Engineer to Assume New Responsibilities (84006). C. R. Mann. 2000 w. Eng News-Rec—Jan 31, 1918. The needs of engineering education.

EDUCATION**Executives**

La Responsabilidad Profesional Del Ingeniere Y Del Arquitectos (84580 D). M. Durrieu. 15000 w. Anales Sociedad Cientifica Argentina—July-Aug., 1917. Professional responsibilities of engineers.

The Training of Engineers (82677). 2600 w. Times Engng Supp—Oct. 26, 1917. Proposed methods of rendering engineers' training more effective through centralization of effort.

The Budding Engineer (82357 A. Ills. 2000 w. Autocar—Oct. 27, 1917. Outline of methods adopted in the school of the Metropolitan and City Police Orphanage, England.

The Training of Engineers (82558 A. 3000 w. Engr—Nov. 2, 1917. Account of meeting in London to discuss the desirability of forming a Central Organization for improvement of engineering training.

A Study of Engineering Enrollment (82416 A). Calvin H. Grouch. 1500 w. Eng Ed—Oct., 1917. Curves showing data collected, with explanatory notes.

Some Comments on the Training of Engineers (83893 A). A. C. Lanier. 5000 w. E Ch St L, J1—Nov.-Dec., 1917. Suggestions based on experience.

The Engineer in the Chemical Industry (83605 A). H. E. Hollister. 1800 w. E Ch Phila, J1—Jan., 1918. Work accomplished since the war.

Engineers in Training (83000 A). Robert Tudor Hill. 2500 w. Met & Chem Eng—Dec. 15, 1917. Desirable changes in technical training.

The Education and Training of Engineers (83056 A). 1200 w. Elec Rev—Nov. 30, 1917. Serial, 1st part. Needed reforms.

Engineer Troops

Instruction of Engineer Troops While in Quarantine (85072 B). Ills. 1000 w. Prof-Mem—March-April, 1918. Report of instruction given by regimental and company commanders.

Equipment Dept.

Equipment Department of a Railroad and Advantages It Offers to Young Men Who Want to Follow a Mechanical Line and Why Some Men Succeed in Life (84529 A). F. W. Brazier, with discussion. 20 pp. Cen Ry Ch Pro—Jan., 1918.

Examinations

Mine Managers' Examinations (87078 A). 1800 w. Colly Gdn—May 31, 1918. Serial, 1st part. Questions set for certificates of competency.

Executives

Training Minor Executives In a Large Shoe Factory (89066 A). Roy Willmarth Kelly. Ills. 3000 w. Ind Man—Oct., 1918.

Factory School

Methods in a New England factory to prepare employees for advancement.

Factory Schools

Training Schools in Factories (85938). Allen Sinsheimer. 2500 w. Auto Ind—April 25, 1918. Plans for increasing the number of skilled workers.

Foremen

Creating a Class of Super-Foremen (86406). J. V. Hunter. 2300 w. Am Mach—May 23, 1918. Ideas in regard to the training of foremen.

Foundrymen

The School End of the Job in Training Foundrymen (84410 N). Clifford B. Connelley. 14 pp. A I Mt, JI—Dec., 1917. The industrial trend of education and the effect upon the foundry industry.

Gisholt System

Training Instructors According to the Gisholt Idea (85730). Fred H. Colvin. 2500 w. Am Mach—April 18, 1918. Serial, 1st part. Principles of a plan for training operators who train other operators.

Glass

Sheffield University's Glass Department (87403 A). Ills. 1500 w. Engr—June 14, 1918. The part it has played in the revival of the glass industry, made necessary by the war.

Hong-Kong

The Engineering Equipment at Hong-Kong University (84843 A). Maps and Plans. 3000 w. Engr—Feb. 15, 1918. Serial, 1st part. The present article describes the port and conditions.

Human Engineering

Teaching Human Engineering in the College Curriculum (85910). Fred H. Rindge. 4000 w. Am Mach—April 25, 1918. New methods for instructing engineering students.

Indexing

Some Suggestions on Filing and Indexing (84527 N). Frank E. Lathe. 8000 w. Can Min Inst, Trans—1917. The systems and their applications.

Industrial Census

What an Industrial Census Can Do (88447 A). Dale Wolf. 3500 w. Ind Man—Sept., 1918. Results of an experiment of the Miller Lock Co., Phila.

Industrial Chemistry

Organic Chemistry in Relation to Industry (87982 A). M. O. Forster, with discussion. 8500 w. Roy Soc Arts, JI—July 12, 1918. Claims its study satisfies most forms of intellectual craving, and is highly remunerative when applied to industrial processes.

Industrial Training

The Effect of the War on Engineering Education (84072 A). C. R. Mann.

EDUCATION**Laboratory**

1800 w. Met & Chem Eng—Feb. 1, 1918. Conclusions from extensive study.

Industrial Training for the War Maimed in Great Britain (86147). I. William Chubb. Ills. 5000 w. Am Mach—May 9, 1918. Work to enable maimed men to support themselves.

Intensive Training

The Engineer, the Cripple and the New Education (82921 A). Frank B. Gilbreth and L. M. Gilbreth. 11 pp. A S M E—Dec., 1917. Progress report stating definitely the work the engineer should do to help the cripple to be independent of charity.

Japan

La Formation Des Ingénieurs Au Japon (84588 C+D). H. Chevalier. 4000 w. Bul Soc Ingénieurs Civils De France—May, 1917. Organization of Japanese engineers in relation to educational institutions. Courses of study recommended.

Kelvin

The Ninth Kelvin Lecture (85245 N). Magnus Maclean. Ills. 24 pp. Instn E, JI—March, 1918. Kelvin as a teacher.

Laboratory

National Physical Laboratory (89078). 2600 w. Times Engng Supp—Aug., 1918. Variety of work and results attained during the past year.

A National Industrial Research Laboratory (85264 A). 2500 w. Engr—March 1, 1918. Excerpts from a lecture delivered by Sir Richard Glazenbrook at the Royal Institution. National Physical Laboratory to be taken over by the State.

The National Physical Laboratory in 1917-18 (88396 A). 4500 w. Engng—July 26, 1918. Serial, 1st part. Editorial review of its history and development, as given in the last Report.

L'istituto Scientifico-Tecnico Ernesto Breda (87704 B). N. Parravano. Ills. 2300 w. Industria—May 15, 1918. Industrial research laboratory of Ernesto Breda, in Milan. Apparatus, equipment and work accomplished there.

The National Industrial Research Laboratory (85417 A). Richard T. Glazebrook. Ills. 6500 w. Engng—March 8, 1918. Lecture at Royal Instn. Also editorial. Reviews the history of the National Physical Laboratory, which is to be taken over by the State.

Les Laboratoires Des Usines André Citroën (85853 C + D). L. Guillet and H. Godfroid. Ills. 7800 w. Revue De Métallurgie—Jan.-Feb., 1918. A splendidly equipped industrial laboratory for researches of all kinds.

Laboratory Apparatus

L'Institut Electrotechnique de l'Université de Toulouse (86497 B). C. Camichel and D. Eydoux. Ills. 3500 w. Génie Civil—Apr. 27, 1918. Mechanical engineering laboratories of the University of Toulouse. Equipment, etc.

Il Laboratorio Sperimentale Di Milano (86462 B). A. Danusso. Ills. 5800 w. L'Industria—Mar. 31, 1918. Material testing laboratory at the Milan Technical Institute. Equipment, facilities and methods.

Laboratory Apparatus

Electrical Laboratory Apparatus for Educational Institutions (83621 A). J. J. Lamberty. Ills. 1200 w. Gen Elec Rev—Jan., 1918.

Marine Education

Engineering Education as Applied to Naval Architecture and Marine Engineering (87198 A). H. A. Everett. 4500 w. Am Soc Mar Dftn, J1—April, 1918. Critical discussion of courses established.

Marine Engineers

Training Engine-Room Crews for America's New Ships (85238). Henry Howard. 1200 w. Power—March 26, 1918. Plan of training inexperienced young men on training ships.

Mathematics

Engineering Mathematics (82409 A). Otto B. Goldman. 28 pp. Ore Soc Engrs, J1—Oct., 1917. Serial, 1st part. Lectures on physical, mechanical and engineering problems.

Mechanical

Experience in Training Mechanical Operators (88794 A). Ills. 1200 w. Iron Age—Sept. 5, 1918. Methods of developing efficient workers from unskilled men and women.

Mechanics

A Curious Misnomer in Mechanics (86284 A). Robert Fletcher. 1500 w. Eng-Ed—April, 1918. Explains misuse of mechanical terms.

Elementary Structural Mechanics (82408 A). C. B. McCollough. Ills. 17 pp. Ore Soc Engrs, J1—Oct., 1917. Serial, 1st part. First of a series of lectures. First two on structural mechanics; later lectures on structural analysis.

Military Training

Commercial Value of Military Training (87187 B). Lewis Sanders. 2500 w. U S Art, J1—Jan.-April, 1918. The objects of military training and the results.

Mine Foremen

Practical Examination for Mine Foremen (88604 A). J. J. Bourquin. 1400 w. Colly Gdn—Aug. 9, 1918. Methods used

EDUCATION

last May by the examining board at Bruceton, Pa.

Mine Managers

Mine Managers' Examinations (83127 A). Ills. 3500 w. Colly Gdn—Dec. 7, 1917. Questions for certificates of competency.

Discussion of Mr. G. L. Kerr's Paper on "The Higher Training of Colliery Managers" (83118 N). 30 pp. Instn Min Engrs, Trans—Nov., 1917.

Mining

Mining Education and Research (82815 A). William Pickup. Presidential address to Manchester Geol. and Min. Soc. 5000 w. Colly Gdn—Nov. 16, 1917. Particularly as applied to the county of Lancashire.

Mining Education

Report on Mining Education in England with Special Reference to India (85827 N). G. F. Adams, E. H. Robertson, and Glen George. 107 pp. Min & Geol Inst of India, Trans—Nov., 1917.

Mining Education and Research in Lancashire; An Appeal for Wider Interest and Greater Support (84936 N). William Pickup, with discussion. 4500 w. Instn Min Engrs, Trans—Jan., 1918. Presidential address.

University Education in Relation to Mining Engineering (84937 N). William Ripper, with discussion. 6000 w. Instn Min Engrs, Trans—Jan., 1918. The movement to prepare trained men for this field.

Mining Engineering

The Human Side of Mining Engineering (86955). James F. Kemp. 5000 w. Min & Sci Pr—June 15, 1918. Commencement address at Missouri School of Mines, on training for personal relations in conducting industrial enterprises.

Motion Pictures

The Motion Picture and Its Relation to Industrial Problems (89031 A). Ernest A. Dench. 3000 w. Am Mach—Sept. 26, 1918. Suggestions for instructing salesmen, solving efficiency problems and obtaining help by means of moving pictures.

Motor Mechanics

The Red Cross School of Motor Mechanics (82564 A). Ills. 2000 w. Autocar—Nov. 3, 1917. Practical help for interned British prisoners in Switzerland.

National Defense

The Engineering Societies in the National Defense (83326 A). Gano Dunn. 4500 w. A S M E, J1—Jan., 1918. Things that are being done by engineers.

Natural Science

Position of Natural Science in the Educational System of Great Britain

Naval Academy

(87720 A). 1400 w. Nature—June 6, 1918. Report of a British committee, with recommendations.

The Teaching of Natural Science (86219 A). 4000 w. Engr—April 19, 1918. Report of Committee appointed to inquire into the position of natural science in Great Britain.

Naval Academy

The Requirements for Admission to the Naval Academy—An Historical Review (84987 A). C. H. Foster. 15 pp. U. S. Nav Inst, Pro—Feb., 1918. Reviews various changes that have taken place.

Naval Training

Engineering Study Directory for Naval Officers Under Training (86259 A). R. R. Smith. 9 pp. U S Nav Inst, Pro—April, 1918. Schedule.

Navy

Training Power-Plant Men for the Navy (85010). Willard Connely. Ills. 1800 w. Power—March 19, 1918. How ship fitters and gas engineers get expert free training for duty with U. S. fleets.

Packard School

Packard Gives Women Complete Mechanical Training (86535). Ills. 1500 w. Auto Ind—May 23, 1918. Thoroughly equipped school accomodating 240 pupils at a time.

Perspective

Perspective in Engineering Education (84912 A). Clement C. Williams. 1200 w. Eng Ed—Feb., 1918. Point of view of engineering operations.

Power Plant

Power Plant Course at Wentworth (83193). Carroll H. Beers. Ills. 1500 w. Power—Dec. 25, 1917. Wentworth Institute's new course in steam and electrical power-plant practice.

Modern Power Plant Education (87869). C. A. Joerger. Ills. 1500 w. Power—July 30, 1918. The co-operative course for engineering students at the University of Cincinnati.

Railway Question

The Business Press and the Railway Question (86056). Samuel O. Dunn. 3000 w. Ry Age—May 3, 1918. From an address before the Cleveland Advertising Club.

Reform

Educational Reform—Its Relation to a Solution of the Industrial Deadlock (82978 N). C. V. Corless. 2500 w. Can Min Inst, Bul—Dec., 1917. Serial, 1st part. Importance of the question; suggestions for desired training, etc.

Reinforced Concrete

Some Observations Regarding the Methods of Teaching the Theory of Re-

EDUCATION

inforced Concrete Design (83801 A). Allen B. McDaniel. 1500 w. Eng Ed—Dec., 1917. Suggests methods.

Repairmen

Emergency War Training for Gas-engine, Motor-Car, and Motor-Cycle Repairmen (85627 N). 74 pp. Fed Bd Voc Ed, Bul. 10—March, 1918. Outlines courses of instruction.

Research

Research and the Industries (88187 A). P. G. Nutting. 2500 w. Sci M—Aug., 1918. Value of industrial research and the training needed.

Research Associations (87887 A). 3000 w. Engr—June 28, 1918. Examines the question of their organization and principles.

Scientific and Industrial Research (89332 A). 2500 w. Engr—Sept. 6, 1918. Serial, 1st part. Summary of the labors during the past year of the Committee of the Privy Council for Scientific and Industrial Research.

The Development of Technical Research (87112 A). 1000 w. Nature—May 16, 1918. General review of progress in technical research.

Topical Discussion on Coöperation in Industrial Research (86993 N). 32 pp. Am Soc Test Mat—June, 1918. Speakers are Dr. Henry M. Howe, Dr. John Johnston, Dr. Arthur D. Little, Dr. Charles L. Reese, and Mr. Frank E. Gorrell.

Industrial and Scientific Research in Italy (85263 A). 2000 w. Engr—March 1, 1918. Information concerning the functions of the Scientific and Technical Committee for Italian industries.

Industrial Research (84395 N). Cecil H. Desch, with discussion. Plates. 20 pp. West Scot I & S Inst, J1—Oct-Nov., 1917. Need of provision for industrial and technical research, especially referring to England.

Efficiency in Industrial Research (84277 A). Charles W. Hill. 3000 w. Met & Chem Eng—Feb. 15, 1918. Important factors in the operation of a research laboratory.

Coöperation in Industrial Research (87616 A). 6000 w. Iron Age—July 18, 1918. Views and achievements of leading workers.

Organization of Industrial Research (87316). 2500 w. Eng News-Rec—July and the news.

War Activities of the National Research Council (87686 D). George Ellery Hale. 26 pp. A I E E, Pro—July, 1918. An account of the development and work of the Council.

American Research Methods (83808 B). Charles H. McDowell, with discussion.

Research Laboratory

20 pp. West Soc Engrs, JI—Oct., 1917. Urges co-operation between industries and educational institutions.

The Co-ordination of Research (83-911). 1300 w. Nature—Dec. 6, 1917. Prevailing opinions on the subject.

The Opportunity for Industrial Research (83337 A). C. E. Skinner. 2500 w. A S M E, JI—Jan., 1918. The study of alloys.

See also Heat Flow, under MECHANICAL ENGINEERING, *Heating and Cooling*.

Research and the State (82661 A). 2300 w. Nature—Oct. 18, 1917. Importance of National laboratories and their value to industry.

Universities and the Supply of Research Workers (82663 A). 2100 w. Nature—Nov. 8, 1917. Advantage of University scholarships. Results in England.

The Answer of the American Chemists and Chemical Industry (82627 A). Thomas B. Brighton. 3500 w. Utah Soc Engrs Mthly JI—Sept., 1917. Shows the importance of chemical research.

Research Laboratory

British National Physical Laboratory (82644 A). I. W. Chubb. 4000 w. Ind Man—Dec., 1917. Review of services rendered and the value to industry.

Science and Industries

The Movement for Closer Application of Science to Industries (88691 A). A. Montgomery. Presidential address to Roy. Soc. of W. Aust. 5000 w. Aust Min Std—Aug. 1, 1918. Reviews steps taken in the British Empire to co-ordinate science and industry.

Valedictory Address by President of South African Institution of Engineers (88692 N). G. M. Clark. 7500 w. So Af Instn Engrs, JI—July, 1918. The value of scientific knowledge in industry and related topics.

British Science In Industry (89074). 2000 w. Times Engng Supp—Aug., 1918. Account of technical exhibits shown at a recent exhibition organized by British Science Guild.

Schools

Vestibule Schools for the Unskilled (87089 A). H. E. Miles. 2200 w. Ind Man—July, 1918. Shows how such schools should be organized and gives results from those in operation.

The Engineering School and the War (83799 A). A. F. Barnes. Presidential address to the S-W. Soc. of Engrs. 3000 w. Eng Ed—Dec., 1917. The effect of the war on American industries.

EDUCATION

Secondary Education

La Réforme De L'Enseignement Secondaire (85852 C + D). H. Le Chatelier. 8500 w. Revue De Métallurgie—Jan.-Feb., 1918. Suggestions for improving secondary training.

Shipbuilders

Training Shipyard Workers at Staten Island (84737 A). R. V. Rickcord. 3000 w. Int Mar Eng—March, 1918. Shipbuilders' school started by state and city departments of education.

Shipyards

Training Shipyard Workers (88180 B). James A. Pratt. 3000 w. Cas Eng Mthly—July, 1918. Outlines a plan for training large numbers of the semi-skilled class.

Shipyard Labor (88417). 1100 w. Times Engng Supp—July, 1918. Recent efforts to expedite work in British yards.

Shipyard Workers

See Training, under MARINE AND NAVAL ENGINEERING.

Shop Schools

Training Men and Boys in a Shop School (89035 A). A. N. Hook. 2000 w. Am Mach—Sept. 26, 1918. Successful methods.

Social Training

A Plea for Definite Training for Social Responsibility by Means of Our Educational Institutions (84528 N). C. V. Corless. 15 pp. Can Min Inst, Trans—1917. Sociological problems discussed.

Specialization

Specialization and Invention (88615 A). W. G. Cass. 1500 w. Engr—Aug. 2, 1918. Considers the relation between specialization and inventiveness.

Spelling

How to Awaken Freshman Interest in Good Spelling (83802 A). A. C. F. Baebenroth. 1800 w. Eng Ed—Dec., 1917. Prevalence of faulty spelling.

Symbols

Symbols for Mechanics and Hydraulics (83800 A). John T. Faig. 1000 w. Eng Ed—Dec., 1917. Methods aiming to standardize practice; results obtained.

Technical Literature

Le Traitement De La Littérature Scientifique (89712 B). P. Otlet. 7000 w. Rev Générale des Sciences—Sept. 15-30, 1918. Coöperation of scientific associations for classification and management of technical literature.

Trade Schools

Industrial Experience of Trade-School Girls in Massachusetts (84231 A). 263 pp. U S Dept Labor, No. 215—Oct., 1917. The problems; new questions involved; experience and wages; conclusions.

Trade Schools

Training

Training 150 Operators Per Week (88268). 2500 w. Auto Ind—Aug. 15, 1918. How the vestibule school of the Remington Arms Co. is meeting the demand for skilled workers of both sexes.

Technical Training for Disabled Soldiers and Sailors (83317 A). Lord Charnwood, with discussion. 10 pp. Roy Soc Arts, J1—Dec. 14, 1917. Size of the problem and schemes in preparation.

Training Engineers and Firemen (83-971 A). Allen W. Ruggles. Ills. 2500 w. Ind Man—Feb., 1918. How the University of Wisconsin is educating them.

Training Schools

Packard Training Schools for Employees (89606 A). D. G. Stanbrough. 3000 w. Ind Man—Nov., 1918.

Training Workmen

Training Workmen for Positions of Higher Responsibility (85801 D). 1600 w. A I M E, Bul—April, 1918. Discussion of F. C. Stanford's paper.

Training of Workmen for Positions of Higher Responsibility (84348 D). F. C. Stanford. 11 pp. A I M E, Bul—Feb., 1918. Educational work to improve the human factor in industry.

Useful Facts

How to Select Those Facts That Are of Greatest Utility (85932). Halbert P. Gillette. 2000 w. Eng & Con—April 24, 1918. Generalizations helpful in determining the usefulness of facts and how to retain them.

Vocational Training

The Evolution of National Systems of Vocational Re-education for Disabled Soldiers and Sailors (87464 N). Douglas C. McMurtrie. Ills. Also bibliography. 310 pp. Gov Print Off, Bul. No. 15—May, 1918. The organization and methods evolved.

Getting Skilled Men by Making Them (87365). Ills. 1500 w. Auto Ind—July 4, 1918. What the Norton Grinding Co. is doing to counteract present labor conditions.

War Effects

Effect of the War on Engineering Education (84218). C. R. Mann. 1800 w.

FINANCE AND COSTS**Accounting**

Power—Feb. 12, 1918. Closer coöperation between school and industry.

War Gas

Chemical Warfare Research (89430 B). Wilder D. Bancroft. 1500 w. J1 Ind & Eng Chem—Oct., 1918. Outlines the research work in developing a war gas.

War Instruction

War Instruction at Massachusetts "Tech" (89263). Ills. 2200 w. Elec Wld—Oct. 5, 1918. Account of instruction and research work in military, naval and aeronautical fields.

Welders

Instructing Welders (84621) Henry Cave. 1200 w. Weld Engr—Feb., 1918. Welding institute established at Jersey City, N. J.

Training Soldier Welders (85812 A). Ills. 5000 w. Weld Engr—April, 1918. Twenty lectures based on practical instruction at army school at Peoria, Ill.

Welding

Plan for Training Welders for Army (83786). 1800 w. Weld Engr—Jan., 1918. Suggestions offered the war department.

Women

Women Engineer Students (82827 A). Ills. 3000 w. Engng—Nov. 9, 1917. Account of an engineering factory in Scotland for the exclusive employment of educated women.

Women Workers

Training the Women War Workers (88496 A). Edward K. Hammond. Ills. 1800 w. Machy—Sept., 1918. Methods used in plant of the Taft-Peirce Co. by means of a "Vestibule" school.

Woman Substation Operators a Notable Success (89006). Ills. 2000 w. Elec Wld—Sept. 21, 1918. Pioneer work by Boston Edison Co. in training women for electrical service positions yields admirable results.

Selection, Training and Supervision of Women Workers (88335). Ills. 2500 w. Auto Ind—Aug. 22, 1918. How high employment standards are maintained.

Women's Work in Munitions (88419). 1300 w. Times Engng Supp—July, 1918. Description of work shown at second Exhibition of technical work by women.

FINANCE AND COST**Accountants**

A Plea for the Cost Accountant (86571 A). George W. Hamilton. 1000 w. Ind Man—June, 1918. Responsibilities of the cost accountant and his recognition.

Accounting

Cost Accounting to Aid Production—I (89086 A). G. Charter Harrison. 10000 w. Ind Man—Oct., 1918. How the principles of industrial management may be applied to a manufacturing system.

Consult Classification of the Index. See page 9.

Accounting

The Inadequacy of Present Depreciation Accounts (88943). Owen Ely. 4000 w. Ry Age—Sept. 20, 1918. Proper accounting methods essential during Government operation. Effect of rules now in force.

A Foundry Cost and Accounting System (87963 A). 3500 w. A S M E, Jl—Aug., 1918. Discussion of W. W. Bird's paper.

Corporation Organization and Accounting (88191 A). William H. Bell. 10 pp. Jl Actcy—Aug., 1918. Serial, 1st part. Deals with matters affecting private corporations conducted for profit.

Liberty Loan Accounting for Small Banks (88190 A). Willard H. Lawton. 1500 w. Jl Actcy—Aug., 1918. System adopted for a small trust company.

Accounting for Liberty Loan Subscriptions (86908 A). Arthur F. Jones. 1000 w. Jl Actcy—June, 1918. The system used in Portland, Ore.

A Simple Cost Accounting System (86956). E. C. Constans. 3000 w. Telephony—June 8, 1918. Details of a system which has proved satisfactory in plant of 2000 subscribers with office force of three people.

A Simple Foundry Cost and Accounting System (86778). William W. Bird. 2000 w. Fndry—June, 1918. Method in Foundry Dept. of Worcester Polytechnic Institute.

Mechanical Devices for Disbursement Accounting (86850). 5000 w. Ry Age—June 14, 1918. Complete report of the committee on disbursement accounts of the Railway Accounting Officers.

Mechanical Accounting Devices for Railway Work (87171). Ills. 5000 w. Ry Rev—June 22, 1918. Abstract of report of committee of the Assn. of Ry. Act. Officers, giving data on the use of mechanical devices in accounting work.

Accounting for the Liberty Loans (83-888 A). Harvey S. Chase. 10 pp. Jl Actcy—Jan., 1918. Serial, 1st part.

Cost Accounting for Oil Producers (83103). Clarence G. Smith. 116 pp. U S Bur Mines—Bul. 158. Descriptions and discussions of balance sheets, profit-and-loss statements and bookkeeping methods adapted to the oil business.

Depreciation Accounting for Public Utility Companies (82184). Frank E. Seidman. 10 pp. Jl Actcy—Nov., 1917. Regulations prescribed by the New York public service commission of the first district.

Importance of Proper Accounting (82211). William M. Brown. 4000 w. Telephony—Nov. 3, 1917. Trend toward

FINANCE AND COSTS**Banking**

standardization of methods. Read at convention of Southern States Independent Telephone Assn.

Property Accounting in the City of New York (82183 A). Raymond W. Bourke. 13 pp. Jl Actcy—Nov., 1917. Discusses accounting for equipment-in-service.

The Elements of Cost Accounting (82182 A). F. C. Belser. 15 pp. Jl Actcy—Nov., 1917. Outlines the various systems.

Power Plant Accounting (85387). Thomas G. Thurston. 2000 w. Natl Engr—April, 1918. Actual operating cost known at the end of each day.

A Foundry Cost and Accounting System (86188 A). William W. Bird. (Abstract.) 1800 w. A S M E, Jl—May, 1918. Outlines a system developed as a result of experiments at Worcester Polytechnic Institute.

Cost Accounting at Coal Mines (86227). J. B. Dilworth. 1800 w. Cl Age—May 11, 1918. Value of cost systems.

Fundamentals of Accounting for Industrial Waste (86419 A). F. J. Knoepfel. 3000 w. Jl Actcy—May, 1918. Industrial accounting; true cost and standard cost.

Standard Accounting Through Price Control (86420 A). Charles Reittel. 2200 w. Jl Actcy—May, 1918. Needed adjustments in accounting practices. A plea for standardization.

Airplanes

Airplane Cost Finding (88443 A). C. H. Hart. 700 w. Ind Man—Sept., 1918. A simple method of recording costs.

American Railroads

The Investment in American Railroads (85431). L. F. Loree. 4000 w. Ry Age—April 5, 1918. What has happened and is happening to invested capital and the relation of the railroads thereto.

Appraisal

Reproduction Method of Appraisal (82629 A). Charles W. McKay. 3000 w. Ind Man—Dec., 1917. Reviews methods formerly used and outlines the reproduction-cost-method and its application.

Appraisement

Reproduction Cost in Industrial Appraisement (83305 A). Charles W. McKay. 3000 w. Ind Man—Jan., 1918. Discusses seven appraisal questions and offers suggestions.

Banking

Banking Institutions to Finance Our Future Abroad (85435). Albert Breton. 3500 w. Ry Age—April 5, 1918. Estab-

Assessments

lishing foreign branches not as effective as partnership with separate banks.

The Export Services of the Banks (85444). 2500 w. Ry Age—April 5, 1918. What banks can do to assist the exporter.

Assessments

The Cambridge, Mass., System of Real Estate Assessments (89407 B). Stoughton Bell, with discussion. 8800 w. Bos Soc C E, JI—Sept., 1918. Explains study made to equalize values and the application of the system.

Barometric Costs

How to Find and Use Barometric Costs (87779 A). C. W. Starker. 2000 w. Ind Man—Aug., 1918. Method of charting cost figures in order to show how changes in cost of material, labor, etc., will influence the finished cost of any unit.

Bonus System

A Bonus System for Power Houses (84901 A). B. H. Blaisdell. Ills. 9 pp. A E R A—Feb., 1918. Result of nearly three years' trial by the Manila Elec. Ry. & Lgt. Co. Success of plan.

Bonus for Power Plant Employees (85239). Warren B. Lewis. 3000 w. Power—March 26, 1918. Based on the saving in costs on unit output of product. Gives directions for quickly determining the bonus due.

British Empire

Our Imperial Strength, Based on the Metal Industries and an Efficient Banking System (84915 N). Octavius Charles Beale, with discussion. 36 pp. West Scot I & S Inst, JI—Dec., 1917. Review of the National position as to sources and security of supplies of base metals; and financial proposal.

British Industry

Wages and Profits in British Industry (84144 A). E. L. Good. 1500 w. Engr—Jan. 18, 1918. Labor's mistaken idea that capital takes a large share of the proceeds of industry and how to remove the delusion.

Business Principles

See same heading under Regulation.

Business Problems

Sees Serious Business Problems Ahead After War (87500). W. S. Kies. From address at Chicago on June 17th. 3500 w. Eng News-Rec—July 11, 1918. Discusses plans for the future of American business.

Business Prospects

What Will Business Be After the War? (82639 A). J. P. Brophy. 1600 w. Ind Man—Dec., 1917. Remarks on the excessive optimism, giving reasons for opinions.

FINANCE AND COSTS**Cost Estimating****Business Systems**

Modern Business Systems and the Engineer (82417 A). E. J. McCaustland. 4500 w. E Cb St L, JI—Sept.-Oct., 1917. Reasons why engineers should interest themselves in business affairs.

Canada

Le Commerce Canadian Après La Guerre (89065 B). L. Lorrain. 3100 w. Rev Trimestrielle Canadienne—Aug., 1918. Considerations on Canadian trade and industry after the war.

Canadian War Finance (82977 N). O. D. Skelton. 15 pp. Am Ec Rev—Dec., 1917. Reviews the course of war finance and considers topics related.

Civil Engineers

A Study of the Earnings of Civil Engineering Graduates (82415 A). Louis Mitchell. 500 w. Eng Ed—Oct., 1917. Charts and notes on a recent study.

Compensation

Forms for Use in Recording Compensation (88790). 2200 w. Cl Age—Sept. 12, 1918. How to keep records to stimulate the work of safety.

The Basis of Compensation for the Railroads (83543). Julius H. Parmelee. 1800 w. Ry Age—Jan. 10, 1918. Analysis of provisions suggested by President.

Compensation Contract

Director General Approves Compensation Contract (88641). 13000 w. Ry Age—Sept. 6, 1918. Statement outlining the scope of the contract, and reason for rejecting certain requests for modifications.

Railway Executives Advisory Committee to Report (88814). Also editorial. 5000 w. Ry Age—Sept. 13, 1918. Recommends the acceptance of the contract as finally approved by Director General McAdoo.

Coöperation

Buying Combinations in the Metal Market (83725). 5000 w. Min & Sci Pr—Jan. 19, 1918. From report on co-operation in American Export Trade; Federal Trade Commission.

Copper Mines

Depletion of Copper Mines in Relation to Income Tax Returns (88189 A). William B. Gower. 11 pp. JI Actcy—Aug., 1918. Accounting in relation to the depletion of mineral deposits.

Cost Estimating

Comparative Cost Estimating for Designers of Reinforced Concrete Buildings (85297). From paper by Clayton W. Mayers for presentation before Am. Concrete Inst. Ills. 4500 w. Eng & Con—March 27, 1918. Illustrates methods of estimating.

FINANCE AND COSTS

Depreciation

Cost-Keeping

Highway Cost-Keeping (89565 N). James J. Tobin and A. R. Losh. 52 pp. U S Dept Agri, Bul 660—Sept. 12, 1918. Principles which govern cost keeping, and their application to highway work.

Cost Keeping System for County Highway Work (88090). H. A. Sewell. 2500 w. Eng & Con—Aug. 7, 1918. Abstract of paper before Washington Assn. of County Engrs. Principles of such systems.

Some Notes Regarding Foundry Cost-Keeping and Methods (87993). M. H. Potter. 2500 w. Can Fndman—July, 1918. Elements of the system. Factors entering into the problem.

Cost Keeping and Construction Accounting (84435). G. Ed. Ross. Before N-W. Soc of Engrs. 3500 w. Eng & Con—Feb. 20, 1918. Outlines methods.

Cost of Keeping for Sand and Gravel Producers (84434). Halbert P. Gillette. Read before Nat. Assn. of Sand & Gravel Producers. 1400 w. Eng & Con—Feb. 20, 1918. Salient features of cost accounting and cost keeping.

Cost-Plus

Hardships of the Cost-Plus Plan (89097 A). J. P. Brophy. 1000 w. Ind Man—Oct., 1918. Difficulties and disadvantages for manufacturers of machinery.

Cost-Plus Contracts

Overhead Distribution for Cost-Plus Contracts (84897 A). Frank E. Seidman. 4000 w. JI Actcy—March, 1918. Some of the important problems of overhead distribution.

Cost-Records

Uniform Maintenance Cost-Records for Roads Adopted in Washington (85467). George F. Cottrell. 2500 w. Eng News-Rec—April 4, 1918. Rules and requirements of recent legislation.

Cost Sheet

A Uniform Cost Sheet (89021). 2500 w. Cl Age—Sept. 19, 1918. Substance of a report on the question of a standard cost sheet.

Cost System

Cost System for a Medium Size Foundry (89239 A). D. O. Barrett. Forms. 2200 w. Iron Age—Oct. 3, 1918. Various forms which have proved their usefulness.

Lot Cost System in Making Winchester Guns (87326 A). W. E. Freeland. Ills. 1500 w. Iron Age—July 4, 1918. Some of the cost forms used. Bonus payments to machine adjusters and instructors.

The Semi-Automatic Cost System (82633 A). F. A. Guignon. Tables. 500 w. Ind Man—Dec., 1917. Novel

method of regarding costs by a system of cross-posting.

A Simple Flexible Cost System (87780 A). G. W. Greenwood. 1200 w. Ind Man—Aug., 1918. Outlines a method of charging up items of cost to show each one at a glance with a minimum amount of bookkeeping.

The Organization of an Efficient Foundry Costs System (85680). M. H. Potter. 2200 w. Can Fndman—April, 1918. The costs are reduced to a poundage basis.

Costs

Expenses and Costs (82704 A). H. L. Gantt. 1000 w. A S M E, JI—Dec., 1917. Discusses means of determining the cost of a manufactured article.

Power Plant Proportional Investment Costs (83324). H. S. Knowlton. 5500 w. Natl Engr—Jan., 1918. Discussed in Boston Edison Street Lighting Rate Case.

Cost Estimates and Estimated Costs (85281 A). H. A. Russell. 3000 w. Ind Man—April, 1918. Estimates and costs can be only approximate. Outlines a method of keeping approximate costs.

Relation Between Interest and Manufacturing Costs (84899 A). Edmund C. Gause. 1000 w. JI Actcy—March, 1918. Some of the reasons why interest should not be included, with arguments.

Capital Charges Considered Along with Current Expenses (84939 N). D. M. Mowat. 1500 w. Instn Min Engrs, Trans—Jan., 1918. How to hold the balance between first cost and maintenance charges.

Spoilage, the Fourth Factor of Cost (84900 A). Frederick W. Kilduff. 1300 w. JI Actcy—March, 1918. Considers spoiled goods accounting.

The Checking of Maintenance Costs (86220 A). F. T. Clapham. 1700 w. Engr—April 19, 1918. Outlines a system, explaining its advantages.

Credit

Credit Expansion Under the Federal Reserve (86863 N). H. L. Reed. 12 pp. Am Ec Rev—June, 1918. Explains the present financial situation and the problem of gold-holdings of reserve banks.

Currency

Note Issues and Currency (88893 N). Alex. Aiken, with discussion. 7500 w. So Af Instn Engrs, JI—Aug., 1918. Outlines a theory of value. The stable value of gold explained, and related topics.

Depreciation

The Depreciation of Railroad Property (82870). G. C. Hand. 5000 w. Ry Age Gaz—Dec. 7, 1917. Exposition on value and depreciation, with suggestions.

Employment

Depreciation of Plant (82196 A). F. T. Clapham. 2200 w. Mech Wld—Oct. 19, 1917. Relation of depreciation and maintenance; points useful in fixing rates, etc.

Theoretical Depreciation (82308 A). James E. Allison. 11,000 w. Tel Engr—Nov., 1917. Problem of depreciation in public utilities as a part of the problem of valuation. Critical discussion.

Some Pitfalls in Regulating Depreciation (88350). John Bauer. 3000 w. Elec Ry JI—Aug. 24, 1918. How deduction of depreciation is determined.

Depreciation and Its Relation to Industrial Appraisalment (85280 A). Charles W. McKay. 2500 w. Ind Man—April, 1918. Causes of depreciation and methods of computation.

The Actuary Theory of Depreciation of Physical Property Values (86060). E. J. Kates. 1500 w. Ry Age—May 3, 1918. Explains theory based upon principles used by the actuary in computing insurance risks.

Employment

Employment Department and Routine of the Curtiss Aeroplane and Motor Corporation (86698 A). Charles E. Fouhy. 2000 w. Ind Man—Nov., 1918. Details of management.

Engineering

The Financial Aspect of Engineering (88889 B). Percy F. Martin. 4000 w. Cas Eng Mthly—Aug., 1918. Discussed from a British viewpoint.

Evaluation

The Most Economical Production Lot (86505 A). E. W. Taft. 1200 w. Iron Age—May 30, 1918. Formulas for exact and approximate evaluation.

Exports

Broader Field for Export Organizations (82988 A). G. A. Harris. 2000 w. Iron Age—Dec. 13, 1917. How demands of foreign buyers are to be met.

A Japanese View of Railway Exports to the East (84444). 2500 w. Ry Age—Feb. 22, 1918. An interview with Akis Kasama of the railway commission.

Foreign Markets

Testing the Buying Power of a Foreign market (89040 A). L. W. Schmidt. 4000 w. Am Mach—Sept. 26, 1918. Suggestions for estimating probable markets in foreign countries.

Foreign Trade

The Powerful Foreign Trade Combinations of Europe (85448). P. Harvey Middleton. 3500 w. Ry Age—April 5, 1918. How to maintain export trade after the war.

Foreign Trade After the War (85541).

FINANCE AND COSTS**Inventories**

2500 w. Am Mach—April 4, 1918. Serial, 1st part. Papers by Guaranty Trust Co. of N. Y. on the subject of financial and economic conditions in foreign countries.

Foreign Trade Outlook as Affected by War (85825 A). James A. Farrell. 3000 w. Iron Age—April 25, 1918. Address before the 5th Natl. Foreign Trade Convention, Cincinnati, O. The year's developments in American industry and commerce.

German Industries

L'Industrie Allemande Et L'Après-Guerre (89063 C + D). Jaurégy, Froment and Stephen. 9500 w. Bul Soc D'Encouragement pour L'Industrie Nationale—May-June, 1918. Economic condition of industrial Germany after the war.

Germany

Planning Economic Supremacy (88348). 3500 w. Naut Gaz—Aug. 24, 1918. How Germany hopes to regain her lost markets. Paper issued by the Guaranty Trust Co. of New York.

The Financial Position of the German Iron and Coal Industries (84659 A). 1500 w. Engng—Feb. 1, 1918. Particulars of the capital and profits of the chief firms.

Gold

Need of Sustaining Gold Production (88777). Courtenay De Kalb. 2800 w. Mfrs Rec—Sept. 12, 1918. Need of action by the Government and explaining the plight of the industry.

Income Tax

The Income Tax—An Engineer's Analysis (89285 A). Carl G. Barth. (Abstract.) 1500 w. A S M E, JI—Oct., 1918. Mathematical investigation, with graphical representations.

Pay the Income Tax in Installments (88456 A). J. P. Brophy. 500 w. Ind Man—Sept., 1918. A reasonable plea for relieving financial strain.

Inflation

Inflation (86862 N). E. W. Kemmerer. 22 pp. Am Ec Rev—June, 1918. The extent of inflation since the war; the evils and benefits.

Insurance

Insurance in Commerce (89512 A). W. W. Kerr. 1400 w. Aust Min Std—Aug. 29, 1918. Lecture at Melbourne, on the functions of insurance in commercial operations.

Inventories

Auditors Responsibility in Regard to Verification of Inventories (84898 A). Edward H. Moeran. 3500 w. JI Actcy—March, 1918. The more important points coming within the scope of the auditor's responsibilities.

Inventory

Underground Plant Inventories (85599). W. W. Kinsley, Jr. Ills. 3000 w. Telephony—April 13, 1918. Methods and forms; their use and results.

Inventory

The Value of a Perpetual Inventory (86061). E. C. Constans. 1600 w. Telephony—May 4, 1918. Explains advantages and what it shows.

Investments

Equitable vs. Confiscatory Return on Investment Devoted to Public Use (83006). 3000 w. Ry Rev—Dec. 15, 1917. Message from Samuel Rea delivered at 11th annual meeting of the Ass'n of Life Ins. Presidents, in New York, Dec. 7, 1917.

Labor Costs

Report on Estimating Labor Costs (87849). 7 pp. Elec Rev, Chi—July 27, 1918. Compiled by the Electrical Estimator's Assn. of Chicago, and presented at the Cleveland convention of the National Assn. of Electrical Contractors and Dealers.

Land Appraisals

What the Land Appraisers of the Delaware and Hudson Company Are Doing (84921). George H. Burgess. 2500 w. Eng News-Rec—March 14, 1918. Determining acreage values government requires.

Liberty Loan

Organizing a Factory Liberty Loan Drive (85184). J. Edward Schipper. 3000 w. Auto Ind—March 21, 1918. Method of planning the campaign.

Living Cost

How to Determine Cost of Living in An Industrial Community (88438 A). Ray M. Hudson. 4500 w. Ind Man—Sept., 1918. Tabulated analysis of the elements of living cost, with comments.

Manufacturing

Manufacturing in Relation to Banking, Research, and Management (86686 A). Walter Rautenstrauch. (Abstract.) 6000 w. A S M E, JI—June, 1918. Economic problems and their solution or relief.

Manufacturing in Relation to Banking Research and Management (84327 A). Walter Rantenstrauch. Ills. 6000 w. E Cb Phila, JI—Feb., 1918. Problems and difficulties, both social and economic.

Market Commission

The State Market Commission of California—Its Beginnings, 1915-1917 (85013 N). Carl C. Plehn. 27 pp. Am Ec Rev—March, 1918. Aim to lessen cost of marketing and control prices of certain foods.

Money Markets

World's Money Markets, Now and After the War (85432). George Paish.

FINANCE AND COSTS**Price-Fixing**

2000 w. Ry Age—April 5, 1918. Wisdom and foresight necessary to meet the situation.

National Finance

The To-morrow of Finance (85658 D). S. N. Patten. 14 pp. An Am Acad—March, 1918. Problems of national finance and how they should be met.

Organization

Standard Factory Organization (82139 A). 2000 w. Engng—Oct. 12, 1917. Notes on problems involved in connection with the financial organization of factories.

Overhead

See same heading under Street and Electric Railways.

Payments

Payment by Results (89329 A). D. Lyon McLarty. 3000 w. Engng—Sept. 13, 1918. Explains the premium bonus system, giving examples worked on the Rowan system, commenting on the division in labor cost effected.

Payment Systems

Premium Bonus System (82933 N). William H. Riddlesworth. 20 pp. Instn E & S Scot, Trans—Nov., 1917. Historical résumé of existing systems; formulæ; diagrams and figures.

Piecework

Determining of Piecework Rates from Charts (88470 A). Otto M. Burkhardt. 1000 w. Am Mach—Aug. 29, 1918. A simple method of figuring prices when the time elements are known.

Power Cost

The High Cost of Power (87778 A). C. M. Garland. 2200 w. Ind Man—Aug., 1918. Shows that faulty design and arrangement of apparatus are frequently causes of excessive costs for power production.

Price

Price Maintenance (86864 N). H. R. Tosdal. 22 pp. Am Ec Rev—June, 1918. Examines the interests of manufacturers and middlemen and the question of consumers' welfare.

Price Maintenance (85014 N). H. R. Tosdal. 20 pp. Am Ec Rev—March, 1918. Legalized maintenance of resale prices.

Price-Fixing

Ore Advanced 25 Cents and Pig Iron \$1 (89147 A). 3000 w. Iron Age—Sept. 26, 1918. Action by price-fixing conference at Washington.

Value and Price Theory in Relation to Price-Fixing and War Finance (85636 N). B. M. Anderson, Jr. 17 pp. Am Ec Rev—March, 1918. Questions based on developments in price-fixing and the problems.

Profits

Various Price-Fixing Plans Proposed (84440 A). 2500 w. Iron Age—Feb. 21, 1918. Latest steps toward centralization of purchases at Washington.

Agreed Prices and Their Meaning to Foundrymen (82794). 1800 w. Foundry—Dec., 1917. Influence of labor on cost of castings. Rates on old material. Meeting of manufacturers in New York.

Profits

Profit Earned and Profit Collected (83890 A). Frederick Thulin. 8 pp. JI Actcy—Jan., 1918. Accounting problems.

Public Utilities

Effect of War Upon Public Utilities (87180). H. Wurdack. 3000 w. Elec Rev, Chi—June 22, 1918. Reviews serious difficulties due to increased costs.

The Financing of Public Utilities (84883 A). Nathaniel T. Guernsey. 2500 w. Sci M—March, 1918. Discusses the regulation of public utilities from the financial standpoint.

The Credit of Public Utilities (86065). Herbert A. Wagner. 3000 w. Elec Wld—May 4, 1918. Commission regulation with limited rate of return should be counterbalanced by elimination of risk.

Purchasing

Collective Selling Is Declared Necessary (88795 A). 3000 w. Iron Age—Sept. 5, 1918. Reviews an important report by Pierce C. Williams on the reconstruction of France. French manufacturers will place orders through a central purchasing agent assisted by French credit.

Hints on Purchasing (88724 A). Frank T. Arms. 3000 w. U S Nav Inst, Pro—Aug., 1918. Outlines fundamental principles of system applied to U. S. Navy.

The Market Gage Dollar (88728 N). D. J. Tinnes. 2000 w. Am Ec Rev—Sept., 1918. Statement of the Market Gage plan for stabilizing the purchasing power.

Railroad Credit

Causes of the Decline in Railroad Credit (84786). John Skelton Williams. 4000 w. Ry Age—March 8, 1918. A letter to the Interstate Commerce Commission outlining conditions which caused the decline.

Railroad Finance

Railroad Finance from the Standpoint of Efficiency (84884 A). Howard C. Kidd. 1500 w. Sci M—March, 1918. Suggests lines conducive to economy of operation, and explains the necessity.

Railroad Financing

Form to Be Taken by New Railroad Financing (84031). 3000 w. Ry Age—Feb. 1, 1918. Recommends that a bondholders' committee be established.

FINANCE AND COSTS**Steel Dumping****Railroad Securities**

Railroad Security Issues Under Government Operation (85645 D). Thomas Conway, Jr. 10 pp. An Am Acad—March, 1918. Discusses the future of investment.

How Will the Railroad Securities Be Affected? (83681). 1500 w. Ry Age—Jan. 18, 1918. Charts and review.

Bankers Report on Railroad Securities (82476). 3500 w. Ry Age Gaz—Nov. 16, 1917. Unsatisfactory condition of railroad credit and conditions necessary to re-establish it.

Fair Play for Investors in Stocks and Bonds of American Railways (83181). James Speyer, in N. Y. Sun. 2200 w. Ry Rev—Dec. 22, 1917. The existing situation and the remedies.

Railroad Wage

Report of the Railroad Wage Commission (86324). 8 pp. Ry Age—May 17, 1918. Increases amounting to \$288,000,000 to be added to increases of \$306,000,000 made by railroads. Abstract.

Railway Finance

Railway Earnings and Expenses for the Year 1917 (83465 A). Frank Haigh Dixon. Diagram. 1800 w. Ry Age—Jan. 4, 1918. (Special No.) Heavy falling off in operating income.

Rates

Investment Cost Basis for Rates (85921). 2000 w. Telephony—April 27, 1918. Decision of Nebraska Commission in ruling on telephone rate increase.

Commodity Prices and Public Utility Rates (86336). William J. Hagenah. Excerpts from paper before Wis. Gas & Elec. Assn. at Milwaukee. 2000 w. Elec Wld—May 18, 1918. Indications that the decline in prices will be very slow after the war.

Salesmanship

Engineering Salesmanship (84985 A). Charles W. Hunt. 1700 w. Mech Wld—March 1, 1918. Serial, 1st part. Read before Manchester Assn. of Engineers.

Selling Price

Determination of Selling Price (83889 A). E. D. Hilton. 7 pp. JI Actcy—Jan., 1918. Critical discussion of recent pamphlet by Harrington Emerson.

Shipyards

See Marine and Naval Engineering.

Statistics

Relation of Statistics and Accounts in Industrial Management (89095 A). Milton B. Ignatius. 4000 w. Ind Man—Oct., 1918. Need of much wider use of statistics, giving suggestions for statistical study and points in regard to the work.

Steel Dumping

See same heading under Regulation.

FINANCE AND COST

United Kingdom

Taxes

Federal Taxes Upon Income and Excess Profits (85628 N). T. S. Adams, with discussion. 37 pp. Am Ec Rev—March, 1918. Problems and the most promising solutions.

Plan to Recast War Excess Profits Tax (83661 A). 2200 w. Iron Age—Jan. 17, 1918. Important amendments proposed; some effects of Supreme Court decision.

Trade

Brazilian Trade Conditions (88898). 1200 w. Naut Gaz—Sept. 14, 1918. The effects of the war upon trade and finance.

Germany's Trade Relations with the Near East (88652). 1800 w. Naut Gaz—Sept. 7, 1918. Commercial conquest planned of the Balkan States and Turkey.

France's Rehabilitation (88653). 1500 w. Naut Gaz—Sept. 7, 1918. Central buying and collective selling to be the rule.

American Trade Possibilities in the Far East (87511). Edward B. Bruce. 3500 w. Ry Age—July 12, 1918. (Sec. 2.) Discussion of present conditions and the future outlook.

Britain's After-War Trade Policy (87526). 2500 w. Naut Gaz—July 13, 1918. Discusses preferential tariffs, coal exports, and commercial relations with enemy countries.

Trade After the War (87548 A). Also editorial. 3800 w. Engr—June 21, 1918. Findings of the departmental committee appointed by British Board of Trade to consider the position of the engineering trades.

Japan's Growing Trade (87363). Dr. Minoru Oka, in *The Japanese Mag.* 1200 w. Naut Gaz—July 6, 1918. Remarkable progress in recent years.

Trade Economy in Relation to Australian Defence (87487 A). W. L. Raws. 3300 w. Aust Min Stan—June 6, 1918. Digest of a lecture at the United Service Institute, Melbourne, Australia.

Engineering Markets of the Near East (89337 A). 3500 w. Engr—Sept. 13, 1918. Information concerning trade opportunities and requirements in Greece, Turkey, Bulgaria, Servia and Roumania.

Franco - Spanish Trade Agreement (89476). 1800 w. Naut Gaz—Oct. 12, 1918. Agreement for mutual exchange of products.

Machine Tool Trade in the Scandinavian Countries After the War (89191 A). O. Ericsson. 2000 w. Machy—Oct., 1918. Opinions of interest to American machine tool builders.

The Proper Basis for a Prosperous Foreign Trade (87805). John L. Har-

rison. 3000 w. Ry Age—July 26, 1918. Interesting views of one who has spent several years in Asiatic countries.

Development of Foreign Trade in Manufactured Products (86085). E. M. Herr. 1700 w. Elec Rev, Chi—May 4, 1918. Address before Manufacturers. Must prepare now for competition.

Commercial Relations of Allies with Russia (86280 A). Sterling H. Bunnell. 2000 w. Iron Age—May 16, 1918. Problems of the American manufacturer in the light of the German invasion.

Export-Trade Problems (86150). Robert S. Alter. From an address at Natl. Foreign Trade Con. in Cincinnati. 4000 w. Am Mach—May 9, 1918. Need of securing foreign trade.

How Machine-Tool Builders Can Co-operate in Foreign Trade (86278). Ludwig W. Schmidt. 2500 w. Am Mach—May 16, 1918. Interesting possibilities.

The Meaning and Methods of German Competition (86218 A). E. T. Good. 2500 w. Engr—April 19, 1918. Discussion of German methods, and steps necessary to compete with them.

Must Prepare Now for After-War Trade (84684). J. K. Clark. 2500 w. Auto Ind—Feb. 28, 1918. Need of co-operation for export business.

The Government and Foreign Trade (83738 A). 1200 w. Elec Rev—Dec. 21, 1917. Serial, 1st part. British trade and methods developed for its future.

The Trade of India with Russia, France and Italy (83735 A). D. T. Chadwick, with discussion. 1500 w. Roy Soc Arts, Jl—Dec. 28, 1917. Effects of the war; and the economic future.

Trade Acceptances

A Business Man's Views Regarding Trade Acceptances (89291). C. E. Crofoot. 3000 w. Auto Ind—Oct. 3, 1918. Advantages analyzed.

Trade Acceptances (86537). George S. Cole. 4000 w. Auto Ind—May 23, 1918. Trade-acceptance system contrasted with open-account methods.

The Trade Acceptance in the Supply Field (86323). 2500 w. Ry Age—May 17, 1918. Discussion of the use of trade acceptance in sales to railway supply companies, and in sales to railways.

United Kingdom

The Economic Condition of the United Kingdom After Three and a Half Years of War (88375 A). Edgar Crammond. 2d Cantor lecture. 7000 w. Roy Soc Arts, Jl—Aug. 2, 1918. Serial, 1st part. Outlines the principal economic changes which occurred.

FINANCE AND COSTS

War Finance

Valuation

Valuation for Rate-Making (88270). J. K. Johnston. Read before Indiana Ind. Tel. Assn. 2500 w. Telephony—Aug. 17, 1918. Question of a reasonable return on the basis used by courts and commissions to determine rates.

Railroad Views on the Valuation Act (83148). 8000 w. Ry Age Gaz—Dec. 21, 1917. Replies of roads to Dr. Proudy's memorandum.

Developments in Railway Valuation (83707). 5000 w. Ry Rev—Jan. 19, 1918. Statement by H. C. Philips of developments of federal valuation.

Solidification as a Factor in Railway Valuation (83683). H. M. Taylor. 1500 w. Ry Age—Jan. 18, 1918. Suggested method for determining the appreciation in the roadbed due to seasoning.

What About Your Plant Values? (83590). E. C. Constans. 1500 w. Telephony—Jan. 12, 1918. Outlines a simple system for valuing telephone plants.

The Value of Manufacturing Property (83986 A). Charles W. McKay. 2500 w. Machy—Feb., 1918. Appraisal methods and items that comprise the reproduction cost method.

Valuation of Public Utilities (84914 A). V. Y. Davoud. 20 pp. Utah Soc Engrs' JI—Jan., 1918. Assumes an existing utility for study.

Commerce Commission Makes First Final Valuation Report in Texas Midland Case (88780 A). 2500 w. Eng News—Rec—Sept. 12, 1918. No single sum is indicated as final value. Depreciation, etc.

Interstate Commerce Report on Texas Midland Valuation (88669). 4000 w. Ry Rev—Sept. 7, 1918. Portion of the report dealing with the protests of the carrier are summarized.

Has the Importance of Federal Valuation of Railroads Been Increased or Lessened by Federal Control of Operation? (85647 D). H. B. Whaling. 2000 w. An Am Acad—March, 1918. Considers valuation necessary.

The Federal Valuation of Railroads in Relation to a Definite Policy of National Railway Control (85629 N). John Bauer, with discussion. 28 pp. Am Ec Rev—March, -1918. Considers the present valuation in connection with national control.

See also same heading under Street and Electric Railways.

Wages

Wage Increase for Agents, Clerks, and Laborers (88642). 4500 w. Ry Age—Sept. 6, 1918. Railroad wages amounting to \$25 a month raises for million employees.

Public Service Says Living Wage Is

\$1115 (88034). 2000 w. Elec Ry JI—Aug. 3, 1918. Claims that present wages give an adequate living standard.

Remuneration of Labor and Its Relation to Output (88179 B). John Holloway. 9 pp. Cas Eng Mthly—July, 1918. Discusses the various methods and their relative advantages.

The Recent Increases in Wages of Shopmen (88100). 2500 w. Ry Age—Aug. 9, 1918. Supplement No. 4 to Order 27 defines trades, names new rates and contains statement.

Problems of Wage Payment (84721 A). H. N. Strouck. 5500 w. Met & Chem Eng—March 1, 1918. General discussion of wage payments, and a description, with charts, of the Benedict-Strouck differential time-bonus system.

Raising Wages With Cost of Living (85003). L. K. Comstock. 2000 w. Elec Wld—March 16, 1918. Serial, 1st part. Plan for paying workers on the basis of living costs.

A Method for a Compensated Wage by Index Numbers (87596 A). L. K. Comstock. 21 pp. JI Actcy—July, 1918. Explains method.

Hearings Before Railroad Wage Commission (84156). 2000 w. Ry Age—Feb. 8, 1918. Nearly all classes of employees ask higher pay.

Hearings Before Railroad Wage Commission (84445). 4000 w. Ry Age—Feb. 22, 1918. Representatives of employers testimony.

Payment, Remuneration and Results (84322 N). C. H. Douglas. 1500 w. Beama JI—Jan., 1918. Difficulties in industrial organization, outlining a plan which seems to meet requirements.

Wage-Payment Legislation in the United States (84334 A). Robert Gildersleeve Paterson. 178 pp. U S Dept Labor. No. 229—Dec., 1917. History of legislation and court decisions.

War Budget

The Making of a War Budget (87681 D). 37 pp. An Am Acad—July, 1918. Four articles by different authors discussing how to pay for the war.

War Debt

Some Cheering Thoughts on the War Debt (87509). John G. Lonsdale. 1800 w. Ry Age—July 12, 1918. (Sec. 2.) Future business is bright.

War Finance

The War Finance Corporation (85437). O. M. W. Sprague. 1600 w. Ry Age—April 5, 1918. Inflation can be prevented only by saving to offset the Government's demands.

Substance and Shadow in War Finance (88727 N). Carl C. Plehn. 15 pp. Am

War Resources

Ec Rev—Sept., 1918. Considers real costs versus money costs, a measure of real costs, inflation, loans versus taxes, etc.

The Broad Point of View on the War and the Industrial Situation (85156). Wingrove Bathon. 2500 w. Am Mach—Feb. 21, 1918. The situation created by the present war.

War Resources

Making Our Resources Available for War (85433). John E. Oldham. 3000 w. Ry Age—April 5, 1918. Individual responsibility.

War Revenue

The War Excess Profit Tax (83319). Philip Wiseman. 2800 w. Min & Sci Pr—Dec. 29, 1917. Meaning of "excess profit"; effect of tax law on gold-mining.

War Revenue Act and Its Relation to Taxpayers (83414). Daniel C. Roper. Address before editors of the trade press. 2000 w. Fndry—Jan., 1918.

The War Revenue Act of 1917 (82976 N). Roy G. Blakey. 24 pp. Am Ec Rev—Dec., 1917. Features of the bill are considered.

MANAGEMENT**Control****War Tax**

Intangible Values and War Tax (83-972 A). Charles W. McKay. 4500 w. Ind Man—Feb., 1918. Discusses features of the war tax for industrial appraisals.

Memorandum on War Excess Profits Tax (83036). 3500 w. Eng & Min JI—Dec. 15, 1917. A protest pointing out the unjust and discriminatory effect of the statute.

War Wages

See same heading under Management.

Wealth

The Social Control of the Acquisition of Wealth (85635 N). Edward Cary Hayes. 17 pp. Am Ec Rev—March, 1918. Equality of possession not possible or desirable, but excessive differences should be subject to control. Studies the problem.

Working Capital

Rational Basis for Determining Working Capital (86620). Gaskell S. Jacobs. 3500 w. Eng News-Rec—May 30, 1918. Analysis of maximum lag of collections behind disbursements.

MANAGEMENT**Airplanes**

Effect of Changes on Airplane Output (89686 A). 3000 w. Ind Man—Nov., 1918. Reasons why manufacturers must abandon the idea of standardized production.

Australia

Works Management and the Industrial Position in Australia (82370 N). Ralph N. Lewis. 2000 w. Comwh Engr—Oct., 1917. Effects of the systems installed. Favors the principles embodied in the Taylor system.

Bonus

Bonus Plan for Boiler-Plant Operations (85370). Haylett O'Neill. 1500 w. Power—April 2, 1918. Outlines plan whereby firemen, boiler cleaners, fire cleaners may share in savings effected in boiler-room.

Bonus System

Giving the Foreman a Bonus (82172). C. B. Lord. 2000 w. Am Mach—Nov. 1, 1917. Unusual method of calculating the bonus.

Business

Business Principles—A Discussion (88446 A). Harold Bates. 5000 w. Ind Man—Sept., 1918. Critical discussion of a point in C. E. Knoeppel's article in July issue.

Significant Changes in Business Management (87925 A). 3000 w. Am Mach—Aug. 1, 1918. Changes occurring in the relations between labor and capital.

Card Index

Card Index Production System (83984 A). Lewis Johnson. 1200 w. Machy—Feb., 1918. Explains advantages of the system, giving sample cards.

Character

Character Analysis (89134 A). 500 w. Ind Man—Oct., 1918. Editorial on the art of character analysis and referring to George K. Parson's views.

Chemistry

Chemistry and Industrial Management (84565 A). Ellwood Hendrick. 2200 w. Ind Man—March, 1918. How chemists can assist industry by improving processes and eliminating waste.

Committees

Workshop Committees (88885 B). 2500 w. Cas Eng Mthly—Aug., 1918. Their functions, importance, and influence.

Control

Graphic Production Control—II (89088 A). C. E. Knoeppel. 4500 w. Ind Man—Oct., 1918. Fifteen laws of control explained.

Graphic Production Control—III (89694 A). C. E. Knoeppel. 5000 w. Ind Man—Nov., 1918. Explanation of laws of control.

Speeding Production by Using Graphic Meters (89172) Ills. 1000 w. Elec Wld—Sept. 28, 1918. How a paper products company has installed a system of circuits which permits the management to

Control System

check from the executive office any operation in the plant.

Graphic Production Control—I (88436 A). C. E. Knoeppel. 3000 w. Ind Man—Sept., 1918. Serial, 1st part. Advantages of the use of graphic methods for recording and controlling industrial production.

Control System

Lodge and Shipley Control System (83289 A). D. M. Perrill. Third article of a serial. Ills. 3000 w. Ind Man—Jan., 1918. Importance and methods of inspection.

Lodge and Shipley Control System (82632 A). D. M. Perrill. Ills. 3000 w. Ind Man—Dec., 1917. Second article of serial on methods in use to control production.

Coöperation

Oliver Iron Mining Co. Adopts Labor Coöperation Policy (87258). 2200 w. Eng & Min JI—June 29, 1918. Outlines the "mutuality plan" adopted.

Getting Employees to Make Suggestions (83278). 1800 w. Elec Ry JI—Dec. 29, 1917. Coöperation of men in solving problems on the Denver tramways.

Extracts from the Address of President Rice at the Midwinter Convention Dinner (84767 D). 2000 w. A I E E, Pro—March, 1918. On the war program and the value of coöperation.

Great War Results Due to Coöperation (84919 A). 4500 w. Iron Age—March 14, 1918. Achievements of the Ordnance Bureau.

How the War Has Taught England Coöperation (84164). William Patten. 1200 w. Am Mach—March 7, 1918. Methods of coöperation in England between labor and capital.

Draftsmen

A Psychological Study of Draftsmen (85909). Frank H. Sommers. 2000 w. Am Mach—April 25, 1918. Who should be held accountable for mistakes?

Economic Departments

Uses of an Economic Department in a Machine-Tool Plant (83665). Ludwig W. Schmidt. 3500 w. Am Mach—Jan. 17, 1918. Reasons why such a department is of value in future policies.

Efficiency

Efficiency—Stop! Look! Listen! (89092 A). V. J. Loomis. 500 w. Ind Man—Oct., 1918. A reply to W. H. Smyth's article in the September issue.

New Problems of Governmental Efficiency (85637 N). A. N. Holcombe. 4000 w. Am Ec Rev—March, 1918. Considers how the purchasing agencies of the government should be organized.

MANAGEMENT**Employment**

Efficiency and Idleness (89691 A). H. L. Gantt. 1000 w. Ind Man—Nov., 1918.

Relative Efficiency of Male and Female Operatives (89166). 4000 w. Auto Ind—Sept. 26, 1918. A study of the experiences of 127 manufacturing establishments in the metal trades.

Profits of Efficiency (86866 N). C. J. Foreman. 18 pp. Am Ec Rev—June, 1918. Gives a method of separating the earned returns of efficiency from the unearned surpluses of the market and of good will.

The War as a Supreme Test of the Efficiency of Business Management and of Labor (87586 A). Edward N. Hurley. 11 pp. La Eng Soc, Pro—June, 1918. Address, at Philadelphia, before the National Coal Assn.

Payment by Results: A Psychological Factor in Workshop Efficiency (87337 A). Alex. Ramsay. 2500 w. Engng—May 31, 1918. Discusses results from various systems of payment.

Criticism and Individual Efficiency (88461 A). Lieut. R. T. Strong. 1200 w. Ind Man—Sept., 1918. How both public and personal efficiency may be improved.

Efficiency—Stop! Look! Listen! (88458 A). William H. Smyth. 1500 w. Ind Man—Sept., 1918. Warning against the ideals of materialism.

The Question of Scientific Management (84235 N). James Richardson. 20 pp. Instn E & S Scot, Trans—Jan., 1918. Considers its application to conditions after the war; its aims are outlined and objections discussed.

Efficiency by Consent (83949 A). Louis D. Brandeis. 1100 w. Ind Man—Feb., 1918. Necessity of consulting with labor concerning industrial changes to secure full coöperation.

Training a Mining Organization in Efficiency Methods (83863). Charles A. Mitke. 2000 w. Eng & Min JI—Jan. 26, 1918. Experiences at the Copper Queen.

Employees

Putting Round Pegs in Round Holes (89099 A). George Kingdon Parsons. 1700 w. Ind Man—Oct., 1918. Value of character estimates in choosing employees.

Employment

Progress of Employment Management (89137 A). 300 w. Ind Man—Oct., 1918. Short editorial on its rapid growth.

Methods of an Employment Office (87785 A). C. S. Rossy. 1200 w. Ind Man—Aug., 1918. Outlines a successful system.

Employment and the Labor Market (85633 N). Charles B. Barnes. 2500 w. Am Ec Rev—March, 1918. The work of

Employment Managers**MANAGEMENT****Human Factor**

the New York State Employment Bureau, showing the need of coöperation.

Employment Department Organization of Thomas A. Edison Interests (85843 A). Mark M. Jones. 1500 w. Ind Man—May, 1918. How employees are secured and the arrangements for transfers, etc.

Lessons from English War Experience in the Employment of Labor (85631 N). M. B. Hammond. 4000 w. Am Ec Rev—March, 1918. The problems due to war and the ways of solving them. Employment of women and the difficulties, etc.

Problems of Returned Soldiers (85842 A). S. A. Goldsmith. 4500 w. Ind Man—May, 1918. Seeking employment for discharged men at close of war.

Employment Service Department for a Plant of 2500 Employees (82157 A). H. L. Robinson. 1200 w. Sfty Eng—Oct., 1917. Methods and work.

Employment Managers

First Epoch of a New Profession (87163 A). Meyer Bloomfield. 1000 w. Ind Man—July, 1918. Reviews the work of the Employment Managers' Assn.

Engineering Appliances

The Overseas Distribution of Engineering Appliances (86430 N). Leonard Andrews. 10 pp. Instn E E—April 18, 1918. Effect of supply and demand upon competition; production, coordination, and distribution. Refers to the British Empire.

Engineers

After Four Years of War (89067). 3200 w. Times Engng Supp—Aug., 1918. The engineer's part in the great struggle from the industrial viewpoint.

Engineering Relationships (89135 A). 600 w. Ind Man—Oct., 1918. Editorial on progress and development in the engineering profession.

The Relation of Engineering to Industrial Management (84106 A). D. S. Kimball. 2000 w. A S M E, JI—Feb., 1918. The service required of engineers and the training needed.

Factories

Factory Investigations (87878 A). Albert A. Dowd. 1500 w. Machy—Aug., 1918. Reasons for employing outside experts, and methods of conducting investigations.

Factory Lighting

The Problem of Daylight in Its Relation to Management (82631 A). C. E. Clewell. Ills. 3000 w. Ind Man—Dec., 1917. Importance of providing light of uniform quality and proper degree.

Factory Location

Hunting for a Factory Location (86563 A). L. W. Schmidt. 5000 w. Ind Man—June, 1918. Five tests to apply in selecting an industrial site.

File Industry

Reform in the File Industry (87940 A). George Taylor. 3500 w. Engr—July 5, 1918. Discusses the factories, the methods, and the management.

Foremen

Instructions to Assistant Foremen (89695 A). George H. Shepard. 4500 w. Ind Man—Nov., 1918. How to treat workmen so as to produce maximum results.

Getting the Foreman's Coöperation (87782 A). William F. Johnson. 2200 w. Ind Man—Aug., 1918. The problem of the relationship between the foreman and the employment manager is discussed.

What I Would Do If I were a Foreman (87162 A). Mark M. Jones. 4000 w. Ind Man—July, 1918. Attitude toward workmen and executives, etc.

Forgings

Organizing to Produce Shell Forgings (84568 A). F. E. Merriam. Ills. 3500 w. Ind Man—March, 1918. Plans and methods that have proved successful.

Foundry Problems

Your Biggest Foundry Problem—Manpower (89224 B). H. Cole Estep. Ills. 4000 w. Fndry—Oct., 1918. More castings with less labor demanded. Machines must do the work of men. (Special number.)

German Industries

L'Industrie Allemande Et La Guerre (89062 C + D). Jauréguy, Froment and Stephen. 25000 w. Bul Soc D'Encouragement pour L'Industrie Nationale—May-June, 1918. The great industries in war time; nitrogen, sulphur, sulphuric acid, fuels, base and precious metals, alcohol, greases, soaps and glycerins, wood, etc.

Harmonizing

Under New Management—Harmonizing (85287 A). Charles M. Horton. 2500 w. Ind Man—April, 1918. The value of coöperation.

Hospitals

Hospital Ornaization (89716 C). R. L. Dickinson. Ills. 9500 w. Bulletin, Taylor Society—Oct., 1917. Organization shown by charts of personnel and powers and functions.

Housing

Planning a Housing Development for an Industrial Plant (89087 A). Benjamin Wilk. 1000 w. Ind Man—Oct., 1918. Suggestions for determining housing needs of workers.

Human Factor

The Human Factor in Industry (82684 A). G. E. Toogood. 5000 w. Cassier's Engng Monthly—Nov., 1917.

India

A modern view of the principles of the human influence on industrial activities.

India

Industrial Development in India During the War (89029 A). D. T. Chadwick. 2000 w. Roy Soc Arts, JI—Sept. 6, 1918. Serial, 1st part. New factories, organization of resources, search of local resources for substitutes, etc.

Index Cards

Getting the Most Out of Index Cards (83973 A). F. J. Schlink. Ills. 2800 w. Ind Man—Feb., 1918. How cards can be notched to give graphic information.

Industrial Efficiency

Presidential Address (84236 N). Edwin L. Orde. 15 pp. N E C Instn, Trans—Jan., 1918. The recent work in England in meeting the requirements of war is reviewed, and the future needs.

Industrial Employment

Employment and Personnel Policy of Thomas A. Edison Interests (85254 A). Mark M. Jones. 3000 w. Ind Man—April, 1918. First of a series of articles to show one of the highest developments in the United States of industrial employment work.

Industrial Morale

The Need for a New Incentive for the Industrial Worker (89290). Harry Tipper. 2500 w. Auto Ind—Oct. 3, 1918. Most work lacking in requirements for effort or good work. Lessons from war.

Industrial Peace

The Foundation of Industrial Peace (85748 A). A. H. Paterson, with discussion. 7000 w. Roy Soc Arts, JI—April 5, 1918. Problems and dangers to be met.

Industrial Policy

After the War (87719 A). H. Louis. 1000 w. Nature—June 6, 1918. Report of British committee on Commercial and Industrial Policy after the war.

Industrial Problems

England Overcame Labor and Industrial Crisis by Intelligence (82583). Condensed addresses by Sir Stephenson Kent, G. H. Baillie, H. W. Garrod, and Cyril Asquith. 3500 w. Eng News-Rec—Nov. 22, 1917. Methods of meeting industrial problems.

Problems of Modern Industry (84253 A). W. L. Hichens. 2500 w. Ir & Cl Trds Rev—Jan. 25, 1918. Abstract of James Watt lecture before Greenock Philosophical Soc. Industry should be a national service in which private gain is subordinated to public good.

Fundamental Factors in Sound Industrial Relations (89684 A). H. T. Walter. Ills. 3500 w. Ind Man—Nov., 1918. Facts essential to an understanding between employers and employees.

MANAGEMENT

Modern Industrial Relations Department (89240 A). E. C. Gould. 1200 w. Iron Age—Oct. 3, 1918. Its organization to handle relations between employer and employees.

Industry

For Victory Through Industry (83284 A). William C. Redfield. 5000 w. Ind Man—Jan., 1918. The pressing need of coöperation in industry for the sake of production.

Industry

Causes of Industrial Unrest: the Remedies (82301 N). F. Dudley Docker. 2000 w. Beama JI—Oct., 1917. Refers mainly to conditions in England.

Industrial Re-construction After the War: the Lines on Which a Situation Might Proceed (82298 N). Victor Fisher. 2200 w. Beama JI—Oct., 1917. Perplexities of the situation.

Organizing Industrially for War (82642 A). C. E. Knoeppel and G. Sumner Small. 5500 w. Ind Man—Dec., 1917. Second article of a serial, showing need of co-operation.

Inspection

Inspection and Quality Control (89093 A). F. E. Merriam. Ills. 5600 w. Ind Man—Oct., 1918. Outlines the organization of an inspection department for manufactured products, the training of inspectors, and the use of inspecting gages.

Labor

Why Do Valuable Men Leave? (89138 A). Russell Waldo. 600 w. Ind Man—Oct., 1918. Some of the causes. Value of old employees.

Basis for Selection of Employees (86574 A). N. D. Hubbell. 2000 w. Ind Man—June, 1918. Outlines the principal points in the employment problem.

The Human Factor in Modern Production (85818). Alex Ramsay. 5000 w. Cas Eng Mthly—April, 1918. Solution of the conflict between capital and labor.

Let Your Employees See Your Shop (85844 A). B. A. Wack. 1200 w. Ind Man—May, 1918. Suggests a department visiting system showing its benefits.

How to Reduce the Turnover of Labor (85396 A). Ernest C. Gould. 1200 w. Iron Age—April 4, 1918. Methods successfully applied at an Ohio Steel Works.

Your Head Indicates Your Talent (85920). Stanley R. Edwards. Ills. 4000 w. Telephony—April 27, 1918. Character analysis. Study of telephone men.

The Problem of Discontent (89110 A). F. B. Guthrie. 1200 w. Aust Min Std—Aug. 15, 1918. Industrial progress a factor of the welfare of the state.

The Problem of Industrial Unrest (89114 A). L. A. Adamson. 2500 w.

Labor

MANAGEMENT

Labor Shortage

Aust Min Std—Aug. 22, 1918. The education of the rich and its defects.

The Problem of Industrial Unrest (89111 A). H. C. Reid. 1000 w. Aust Min Std—Aug. 15, 1918. Importance of industrial and economic education.

Works Committees (87723). 3500 w. Times Engng Supp—June, 1918. Report of a British committee on joint committees of managers and workmen.

Another Source of Labor Supply (87786 A). Donald A. Hampson. 500 w. Ind Man—Aug., 1918. Inmates from institutions of correction, and the mildly insane.

Minimum Turnover in Machine-Shop Labor (87792 A). Stanley H. Bullard. 2000 w. Iron Age—July 25, 1918. Principles which have guided the Bullard Machine Tool Co. and the results.

Wages and Hours of Labor in Cotton Goods Manufacturing and Finishing, 1916 (87794 A). 255 pp. U S Dept Labor, No. 239—April, 1918. Rates of wages per hour, hours of labor per week, and full time and weekly earnings, with description of the processes, etc.

Why Men Leave Their Jobs (87784 A). Henry P. Dutton. 2500 w. Ind Man—Aug., 1918. Analysis of some of the reasons, with possible remedies.

Mobilizing Intelligence on American Railways (84446). Norman Collyer. Abstract of address before the Pacific Ry. Club. 3000 w. Ry Age—Feb. 22, 1918. Labor turn-over problem.

Report of Committee XXII—On Economics of Railway Labor (84476 N). 72 pp. A R E A, Bul—Dec., 1917.

Under New Management—Judging Men (84573 A). Charles M. Horton. 3000 w. Ind Man—March, 1918. Efficiency methods' success depends on intelligent handling of labor.

The Problem of Industrial Unrest (88130 A). 1200 w. Aust Min Std—June 27, 1918. The moral value of work.

The Problem of Industrial Unrest (88138 A). R. F. Irvine. 1500 w. Aust Min Std—July 4, 1918. Serial, 1st part. The political economy of masters.

The Problem of Industrial Discontent (88131 A). J. H. Butters. 3000 w. Aust Min Std—June 20, 1918. Suggestions for industrial reconstruction after the war.

Man Power of the Future (88046 B). Harry Tipper. 2200 w. S A E, JI—Aug., 1918. The force of labor idealism.

Home Attractions Keep Track Laborers Satisfied (87852). Clifford A. Elliott. Ills. 1800 w. Elec Ry JI—July

27, 1918. Ways of solving the labor problem, by the Pacific Electric Ry.

Getting Together (88460 A). William Judson Kibby. 1200 w. Ind Man—Sept., 1918. Disadvantages of antagonisms between employers and workmen.

Unity Versus Trade Unionism (88439 A). L. L. Warren. 1500 w. Ind Man—Sept., 1918. A plea for coöperation by employers and unions.

Labor-Turnover Records and the Labor Problem (82922 A). Richard B. Gregg. 6 pp. A S M E—Dec., 1917. Advocates the application of rational methods of analysis.

The Old Hand (83168 A). James Edgar. 1200 w. Mech Wld—Dec. 14, 1917. In defence of the employment of men over forty.

How to Get Help (83309 A). N. D. Hubbell. 1800 w. Ind Man—Jan., 1918. Suggests methods used with varying success.

Labor Economy

Labour Rations For Factories (87142). 2500 w. Times Engng Supp—May, 1918. Necessity of economizing man power.

Labor-Maintenance

Beginnings of Labor Maintenance Service in a Small Plant (88442 A). Mary L. Morris. 2500 w. Ind Man—Sept., 1918. How it can be adapted to the needs of the small plant.

Labor Problems

How a Medium-Sized Plant Solves Its Labor Problems (88495 A). H. E. Sloan. 1000 w. Machy—Sept., 1918. Underlying principles in the management of the Cushman Chuck Co.

The Employer and Money (89688 A). L. L. Warren. 1200 w. Ind Man—Nov., 1918. Honest, sincere treatment more helpful than money in solving problems.

Social and Religious Organizations as Factors in the Labor Problem (84349 D). E. E. Bach. 10 pp. A I M E, Bul—Feb., 1918. Account of sociological work of the Ellsworth Collieries Co.

Mental Examination for Employees (82635 A). C. S. Rossy. 3500 w. Ind Man—Dec., 1917. Needs of mental examination and classification of defects.

Labor Shortage

Making Up the Labor Shortage (85901 A). D. N. Crosthwait, Jr. 1400 w. Ind Man—May, 1918. The needs and reserve labor available.

Labor Shortage Made Good by Station Contract System (88960 A). F. P. Kemmon. Ills. 1600 w. Eng News-Rec—Sept. 19, 1918. Account of methods used on the Winnipeg aqueduct and results.

Labor Turnover

How the Railway Labor Shortage Can Be Overcome (86045). 2500 w. Eng News-Rec—May 2, 1918. Need for better treatment of men, wider use of machines and careful planning of work.

Labor Turnover

The Problem of Labor Turnover (86275). M. C. Hobart. 2500 w. Am Mach—May 16, 1918. Statement of conditions and expense of labor turnover.

Labor Turnover—Discussion (89689 A). E. Goldberger. 1200 w. Ind Man—Nov., 1918. Details of a method applied and found satisfactory.

Labor Turnover (88463 A). 400 w. Ind Man—Sept., 1918. Editorial on points in the symposium given.

Computing Labor Turnover (88462 A). 7000 w. Ind Man—Sept., 1918. A questionnaire on labor turnover.

The Employment Manager and Labor Turnover Reduction (85800 D). 3000 w. A I M E, Bul—April, 1918. Discussion of Thomas T. Read's paper.

Labor Turnover (85907) Philip Brasher. 4000 w. Am Mach—April 25, 1918. Various phases of the problem are discussed.

Keeping Track of Labor Turnover (88808). E. H. Fish. 1600 w. Auto Ind—Sept. 12, 1918. Value of carefully compiled turnover records.

The Employment Manager and the Reduction of Labor Turnover (84347 D). Thomas T. Read. 13 pp. A I M E, Bul—Feb., 1918. Centralized living. Methods used. Results.

Machine Arrangement

How to Locate Machine Tools (83970 A). Gustav H. Radebaugh. Ills. 2500 w. Ind Man—Feb., 1916. Coördinated system of machine arrangement.

Machine Work

Managing Non-Repetitive Work (87738 A). Norman Howard. 1500 w. Ind Man—Aug., 1918. Standardization of machine work. Planning and scheduling special operations.

Management

Theorieën evaringen over bedrijfsleiding (85855 B). E. Hijmans. Ills. 12,300 w. Ingenieur—Feb. 23, 1918. Theory and practice of management in relation to wage systems. Organization and practice in Dutch machine shops.

Who Is Boss in Your Shop? (84577 B). M. L. Cooke. 7300 w. Bull-Taylor Society—Aug., 1917. Individual vs. group leadership in relation to democracy.

Works and Workers (85205). 2000 w. Times Engng Supp—Feb. 22, 1918. Individual management and central control in contrast. Effects on the personnel, etc.

MANAGEMENT**Negro Labor****Managers**

Les Hommes Qu'il Nous Faut Pour L'Organisation Du Travail (87707 C + D). P. Pezen. 23000 w. Revue De Métallurgie—May-June, 1918. Detailed characterization of the kind of men needed for leaders in industry.

Under New Management—The Manager (87745 A). Charles M. Horton. 4000 w. Ind Man—Aug., 1918. Last article of a series. Requirements, characteristics, habits and personality of the successful industrial manager.

Employing the Employment Manager (87783 A). 2200 w. Ind Man—Aug., 1918. Critical discussion of the attitude of employers toward managers.

Man-Power

Man-Power Under Scientific Management (87567 A). Ills. 14 pp. Cas Eng Mthly—June, 1918. Investigation of the physical capacity of man. Necessity of replacing human power by machinery.

Manufacturing

Relation Between Production, Development and Sales (87776 A). George J. Kirchgasser. 900 w. Ind Man—Aug., 1918. The importance of factory managers knowing something about marketing.

System at the Lanchester Works (84842 A). Ills. 3300 w. Engr—Feb. 15, 1918. Account of the manufacturing system of the Lanchester Motor Co.

Merchant Marine

See same heading under MARINE AND NAVAL ENGINEERING.

Methods

Valuation of Power Plant Methods (87134 C). W. N. Polakov. 1400 w. Paper read before Tech. Assoc. Pulp & Paper Industry at Dayton, O., May 16, 1918. Paper, May 22, 1918.

Methods

Under New Management—From Old to New (85898 A). Charles M. Horton. 3500 w. Ind Man—May, 1918. New attitude of managers illustrating a kindlier feeling toward workers.

Mill Crews

The Morale of Mill Crews (89486 A). Paul T. Bruhl. 2000 w. Eng & Min J—Oct. 12, 1918. A plea on behalf of millmen. Suggestions.

Munitions

Efficiency in Munitions Production (86477). 3100 w. Times Engng Supp—Apr. 26, 1918. Reserves of men and output of factories. British Government now demanding maximum efficiency.

Negro Labor

Negroes a Source of Industrial Labor (87749 A). Dwight Thompson Farn-

Office Methods

ham. Ills. 5000 w. *Ind Man*—Aug., 1918. Conditions and problems of their successful employment.

Office Methods

Some Notes on Office Equipment and Methods (80441 A). C. M. Ripley. Ills. 4500 w. *Gen Elec Rev*—Oct., 1918. Suggestions for eliminating useless work.

Procedure in Office of Construction Engineer, Employing Small Staff, Supervising Expenditure of \$2,000,000 for New Improvements (85511 A). H. W. Skidmore. 3500 w. *Mun Eng*—April, 1918. Field and office methods.

Operation Diagrams

See same heading under **MECHANICAL ENGINEERING, Machine Works and Foundries.**

Order Records

Combined Schedule - Record - Route Sheet (86572 A). E. T. Spidy. 300 w. *Ind Man*—June, 1918. Diagrams and explanation of their use.

Ordnance

Handling Ordnance Supplies (85163). 4000 w. *Am Mach*—March 7, 1918. Methods adopted by the Ordnance Department. Ordnance Bureau, U. S. A. (83976 A). 700 w. *Ind Man*—Feb., 1918. Editorial on the vastness of the task and the work of the Bureau.

American Ordnance in France (83339 A). Capt. Fogg. 1000 w. *West Ry Ch*, Pro—Nov. 19, 1917. Needs of the American Ordnance department.

Organization

The Organization of Commercial Intelligence (85514 A). William H. Clark, with discussion. 9500 w. *Roy Soc Arts*, JI—March 22, 1918. Outline of the work and aims.

Organization of Government Railroad Administration (85564). 2500 w. *Eng News-Rec*—April 11, 1918. Chart showing the branches of regional, central and advisory sections, explaining their functions.

A Storekeeping Organization in Russia (85840 A). Percy R. Clark. 1800 w. *Ind Man*—May, 1918. Convenient forms used where means of communication are primitive, truckmen illiterate and storekeepers poorly educated.

The Spirit of the Organization (87746 A). William Judson Kibby. 2000 w. *Ind Man*—Aug., 1918. Appeal for better understanding between employers and workmen through improvement in aims and conduct of foremen.

Contract Organization Vitrally Important for War Work (88058 A). Francis Donaldson. 3500 w. *Eng News-Rec*—Sept. 19, 1918. Careful co-ordination of forces needed. Charts show typical contracts.

MANAGEMENT**Organization**

Developing the Community Interest (84110 A). Ills. 2000 w. *Iron Age*—Feb. 7, 1918. Organizations of the Burroughs Adding Machine Co. for relief and recreation.

Management Applied in Winchester Shops (84441 A). W. E. Freeland. Fourth article of a series. Ills. 2500 w. *Iron Age*—Feb. 21, 1918. New form of organization in cartridge departments and results.

Propaganda in Industrial Relations (84569 A). L. L. Warren. 1500 w. *Ind Man*—March, 1918. Relations of the human element in labor.

The Need for Organization in New Chemical Companies (84276 A). Frank Hemingway. 2000 w. *Met & Chem Eng*—Feb. 15, 1918. Address before Am Inst of Chem Engrs, dealing with problems of importance.

Mass Production at the Winchester Shops (84756 A). W. E. Freeland. Ills. 2500 w. *Iron Age*—March 7, 1918. Details as typified in making of cartridges.

Thinks Federation of Strong Local Societies Needed for Engineering Unity (84794). C. E. Drayer. From address at Duluth. 3000 w. *Eng News-Rec*—March 7, 1918. Organization like that of the National Chamber of Commerce advocated.

Utilize the Non-Essential Industries (84754 A). Sterling H. Bunnell. 2500 w. *Iron Age*—March 7, 1918. Rearrangement of industries for effective war work.

An Industrial Achievement of the War (83960 A). L. P. Alford. 2500 w. *Ind Man*—Feb., 1918. Application of management principles to the U. S. Ordnance Bureau.

Master Control of American Industries (83975 A). 1800 w. *Ind Man*—Feb., 1918. Editorial on the need of control, with suggestions.

The Winchester Plan of Management (83437 D). W. E. Freeland. Ills. 3500 w. *Iron Age*—Jan. 3, 1918. (Special No.) Outlines a modified type of functional management, discussing the philosophy on which it is based.

The Winchester Engineering Organization (83660 A). W. E. Freeland. 3000 w. *Iron Age*—Jan. 17, 1918. Duties of chiefs of general manager's staff and their committee interrelations. Second article of series.

Handling Costs at Winchester Plant (83785 A). W. E. Freeland. Ills. 2500 w. *Iron Age*—Jan. 24, 1918. Part III.

See same heading under **Finance and Costs.**

Organization—A Material Planning Department (82983). C. A. Marston and J. Edward Schipper. Charts. 2000

Output

w. Auto Ind—Dec. 13, 1917. Serial, 1st part. System successfully installed by Hupp, applicable to any large manufacturing organization.

Organization of the Western Electric Co. (82985 A). H. A. Halligan. From paper read before the Taylor Soc. 2000 w. Iron Age—Dec. 13, 1917. Ideal is highly developed functional management with adequate central control.

Output

A Method of Regulating Shop Output (88690 A). E. T. Spidy. 2000 w. Ry Mech Engr—Sept., 1918. Explains a graphical method and its advantages.

Payroll Records

How Five Firms Keep Payroll Records Up to Date (86575 A). Articles by George B. Merriam, John C. Bower, Holland L. Church, M. C. Hobart, and William Lamkie. 5000 w. Ind Man—June, 1918. Use of employment records.

Piecework

See same heading under Finance and Costs.

Piece Work System in Railway Shops (87438 A). W. J. McClelland. 5000 w. Ry Mech Engr—July, 1918. Organization of methods for determining proper prices and of the forms used.

Planning

Planning and Progressing (86859 B). John Halloway. 10 pp. Cas Eng Mthly—May, 1918. Methods, with examples.

Planning Department in Modern Shops (82864 A). From an address before the Providence Eng. Soc. Cooper. 1700 w. Mech Wld—Nov. 23, 1917. Serial, 1st part. Routing, instruction, time and cost, discipline, etc.

Power

Mastering Power Production—X (89693 A). Walter N. Polakov. 3500 w. Ind Man—Nov., 1918. Conclusion of series. Comparison of large central stations and small isolated plants.

Mastering Power Production—IX (89008 A). Walter N. Polakov. 9 pp. Ind Man—Oct., 1918. Methods of determining standard power costs.

Mastering Power Production—VII (87087 A). Walter N. Polakov. Charts. 7000 w. Ind Man—July, 1918. Analysis of four methods used to pay additions to regular wages. Considers task work with bonus the only scientific way.

Master Power Production—VI. (86568 A). Walter N. Polakov. 5000 w. Ind Man—June, 1918. Thorough training of workers precedes successful operation.

Power Plants

System in the Power Plant (85358). J. C. Hawkins. 2000 w. Pwr Pt Eng—

MANAGEMENT**Scientific Management**

April 1, 1918. Suggestions for increasing efficiency and economy.

Production

Industrial Production (85386 A). William M. Dollar. Abstract of paper before Eng Soc of Buffalo. 4000 w. A S M E, JI—April, 1918. Elementary principles of increasing production and decreasing cost.

Keeping Track of Production (88457 A). H. A. Russell. 3000 w. Ind Man—Sept., 1918. Useful forms for recording progress of work.

Production Standards for War (83916). 1000 w. Times Engng Supp—Nov. 30, 1917. Coordination between manufacturers and Government.

Profit-Sharing

Human Valuation (85896 A). George Kingdon Parsons. 2200 w. Ind Man—May, 1918. Relation of employer and employee, with emphasis on profit sharing.

A Fair Basis of Profit-Sharing (83974 A). George Kingdon Parsons. 4500 w. Ind Man—Feb., 1918. Unique system, apportioning profits to managers, salesmen, clerks, mechanics and laborers.

Public Utilities

Present War Production Made Possible by Utilities (89005). Ills. 2000 w. Elec Wld—Sept. 21, 1918. The aid public utilities have given to production for war.

Purchasing

Organizing a Purchasing Department (84574 A). G. Sumner Small. 4500 w. Ind Man—March, 1918. Methods for successful purchasing discussed.

Reports

Putting It Up to the President (83296 A). Lester Bernstein. 2000 w. Ind Man—Jan., 1918. Faults of reports; purposes, arrangement, etc.

Route Sheets

Method of Making Route Charts and Route Sheets (84579 B). J. W. Carter. Ills. 2700 w. Bul-Taylor Society—Aug., 1917. Control and graphical charting of assembling operations.

Salariat

The Judgment of the Salariat (82299 N). T. C. Elder. 1700 w. Beama JI—Oct., 1917. The position and influence of salaried workers.

Salvage

Salvage Department of the Westinghouse Lamp Company (89094 A). A. W. Ross. Ills. 400 w. Ind Man—Oct., 1918. Report of the work.

Scientific Management

Science and Administration (87718 A). W. A. J. O'Meara. 1500 w. Nature—June 6, 1918. Need of scientific methods of administration in industry. Influence of politics, etc.

Service Cost

Practical Application of Scientific Management (85816 B). 3300 w. Cas Eng Mthly—April, 1918. Describes the practical application of the Taylor system.

Service Cost

The Elimination of Office Routine (89668). E. C. Constans. 2500 w. Telephony—Oct. 26, 1918. Form in use by operating company which eliminates many useless operations.

Shipbuilding

Management—The Solution of the Shipbuilding Problem (89683 A). W. L. Churchill. 4500 w. Ind Man—Nov., 1918. A study of the work, urging the application of the principles and methods of management.

Shop Gardening

Cooperative Shop Gardening (84613 A). Charles E. Hildreth. Ills. 700 w. Ind Man—March, 1918. A farm project for employees.

Shop Gardening as a War Measure (84614 A). Luther D. Burlingame. Ills. 3500 w. Ind Man—March, 1918. How factory employees can help increase the food supply.

Shop Practice

See same heading under MECHANICAL ENGINEERING, *Machine Works and Foundries*.

Soldiers

Opportunities for Returning Soldiers (88630 A). 2500 w. Am Mach—Sept. 5, 1918. Plan suggested by Secretary Lane for dealing with home coming soldiers.

Standard Practice

How to Write and Use Standard Practice Instructions in Your Shop (85897 A). Willard S. Worcester. 3000 w. Ind Man—May, 1918. A system of instructions for every department and every operation, for the purpose of saving time and effort.

Stock Storing

Economic Factors Connected with Storing (88225 A). H. B. Twyford. Ills. 2500 w. Iron Age—Aug. 15, 1918. Discusses the proper quantities of materials and supplies to keep in stock.

Storage

Principles of Storage Applicable to Army Supplies (84578 B). H. W. Shelton. 7800 w. Bul-Taylor Society—Aug., 1917. Means of decreasing the cost of handling.

Strikes

A Saturnalia of Strikes (82811 N). 8000 w. Cham Mines W Aust, Mthly J1—Aug. 31, 1917. Labor troubles in Australia.

Superintendents

Shop Stewards (85883). 1200 w. Times Engng Supp—March 29, 1918. A French view of the functions of shop stewards outlined by an English correspondent.

MANAGEMENT

Switzerland

Le Développement Industriel De La Suisse Depuis La Guerre (88428 B). L. De Launay. Ills. 2800 w. La Nature—July 13, 1918. Industrial development of Switzerland during the war. Former watch factories now making shells for France.

Task Work

The Human Factor in Task Setting (89685 A). W. E. Camp. 2500 w. Ind Man—Nov., 1918. Conditions that affect the human factor, showing that it is possible to pre-determine the proper allowance.

Taxation

Taxation, Rating and Valuation of Mines (85259 A). David Bowen, with discussion. 7000 w. Colly Gdn—March 1, 1918. Read before the Surveyors' Instn. Principles of taxation and taxing systems, reliable value, etc.

Taylor System

Maintenance of Machinery and Equipment (82683 E). H. K. Hathaway. 1200 w. Bul Taylor Society—May, 1917. Maintenance of machinery and equipment as a part of the Taylor system.

Time Studies

Organisation Scientifique De L'Usage (89705 B). P. Denis. Ills. 4800 w. Génie Civil—Sept. 21, 1918. Serial, 1st part. Time studies for machine tools.

Time Studies for Rate Setting on Gisholt Boring Mills—IV (89089 A). Dwight V. Merrick. 10 pp. Ind Man—Oct., 1918. Tables are given and details of machine manipulation.

Time Studies for Rate Setting on Gisholt Boring Mills—II (87775 A). Dwight V. Merrick. 1800 w. Ind Man—Aug., 1918. Tables showing results of detailed studies.

A Time Study of Variable Operations (87743 A). Carle M. Bigelow. 2500 w. Ind Man—Aug., 1918. Planning the piling of lumber results in greatly increased output and decreased labor cost.

Time Studies for Rate Setting on Gisholt Boring Mills—III (88437 A). Dwight V. Merrick. Ills. 2000 w. Ind Man—Sept., 1918. Continuation of the timing of operations for moving head, securing tool and making cut.

Preventing Man and Machine Idleness (86562 A). William L. Albro. 3000 w. Ind Man—June, 1918. A system of checking up useful time and idle time of both men and machines as applied in a large automobile factory.

Time Studies

Trade

Time Studies for Rate Setting on Machine Tools (86559 A). Dwight V. Merrick. 5000 w. Ind Man—June, 1918. Serial, 1st part. Articles explaining the object and methods of time studies.

Trade

The Promulgation of Improvements in Design and Manufacture (86129 A). 1800 w. Elec Rev—Apr. 12, 1918. The value of publicity campaigns in promoting trade and of individualistic competition to improve quality of products.

Trade Acceptance

The Trade Acceptance in the Supply Field (84652). 2500 w. Ry Age—March 1, 1918. First of two articles showing its important advantage.

Trucking

Need for Organized Trucking (89109 A). W. C. Nisbet. 2500 w. Ind Man—Oct., 1918. Suggestions for improving present conditions.

Wages

Equal Payment for Equal Work by Female Workers (89152 A). 1600 w. Engng—Aug. 30, 1918. Editorial discussion of piece work prices, bonus system, time rate, etc.

Supplements Affecting Wages of Signal Men (89388). 2500 w. Ry Sig Engr—Oct., 1918. Recent orders covering salary increases.

A System of Labor Compensation (86966 A). M. K. Smogorjevsky. 4500 w. Ry Mech Engr—June, 1918. A combination of the Taylor, piecework, and Prusso-Hessian methods developed in Russian railway shops.

Co-operative Payment - by - Results (86720 A). 1500 w. Engr—May 17, 1918. A simple but ingenious system which has given satisfactory results.

Wage Systems

Les Salaires Owniers (82700 C & D). H. Le Chatelier. 3500 w. Revue de Métallurgie—July-Aug., 1917. Review of various wage and bonus systems.

A "One-Price" System of Wages (82634 A). E. F. Henry. 1500 w. Ind Man—Dec., 1917. Appeal for a definite standard of wages.

Discontent and the Wage System (82297 N). S. G. Hobson. 3000 w. Beama JI—Oct., 1917. New ideas and theories in Great Britain.

The War Bonus and Electric Raliways (82160 A). E. G. Connette. 2500 w. A E R A—Oct., 1917. System in effect in England, Canada, and some American cities.

Les Formules De Salaire Moderne (82659 C + D). M. Goupil. 3500 w. Annals Des Ponts Et Chaussées—July-Aug., 1917. Theory of wage systems of

MANAGEMENT

Women Workers

Taylor, Lallemand, Halsey, York, Rowan, Carvalho and others. Reduction to mathematical expressions.

War Effects

A New Conception of Things: Capital, Labor, Government and the State (84321 N). J. M. Scott Maxwell. 1100 w. Beama JI—Jan., 1918. Outlines views concerning the possibilities after the war of increasing the production of wealth.

War Industries

War Industries Being Brought Under Modern Engineering Control (84247). Mont Schuyler. 2000 w. Eng News-Rec—Feb. 14, 1918. Use of progress chart by Ordnance Department.

War Wages

War Wages in England and France (86215 A). 1500 w. Engr—Apr. 19, 1918. Bonuses for time-workers and advances in cost-of-living.

War Work

Back Up Your Boys in France (89136 A). 300 w. Ind Man—Oct., 1918. Short editorial on the possibilities for service.

Planning for War Work (85975 A). Alfred Spangenberg. 1600 w. Machy—May, 1918. Making estimates for manufacturing for the government and equipping a factory for war work.

Wastage

Wastage in the Factory (82363 A). James Edgar. 1200 w. Mech Wld—Oct. 26, 1917. Calls attention to waste and advantages from factory economies.

Waste

Eliminating Wastes in Factory Office Supplies (82630 A). Frederick J. Knob. 1500 w. Ind Man—Dec., 1917. Large savings possible through more systematic ordering and keeping of records.

Industrial Waste—A Tax Paid to Ignorance (82628 A). William N. Berkeley. 800 w. Ind Man—Dec., 1917. Calls attention to waste of natural resources and manufactured products.

Industrial Waste Produced (88411). 1700 w. Times Engng Supp—July, 1918. Waste Products and how they are reclaimed.

Prevention of Waste vs. Reclamation of Scrap (88015 A). Henry J. Miller. 1500 w. Ry Mech Engr—Aug., 1918. Discussion of the scrap problem.

La Récupération et L'Utilisation des Déchets de L'Industrie Siderurgique (86474 B). P. Razous. 3800 w. Génie Civil—Apr. 6, 1918. Serial, 1st part. Recovery and utilization of metal wastes.

Women Workers

Wartime Experience With Women in the Metal Trades (89018). 1200 w. Open Shop Rev—Sept., 1918. Their efficiency in machine shop work demonstrated.

Women Workers

American Women in War Industry (86567 A). C. E. Knoeppel. 4500 w. *Ind Man*—June, 1918. Serial, 1st part. How are they to be selected and trained, and the problems of war wages, hours, and working conditions.

Women in Filling Factories (86478). 1000 w. *Times Engng Sup*—Apr. 26, 1918. Advantages of employing women to release men for war work.

Putting Women Into the Machine Shop (89415 A). F. L. Prentiss. Ills. 3000 w. *Iron Age*—Oct. 10, 1918. Successful in Cleveland plants; qualities in which women excel.

Introducing Woman Labor Into the Shop (89647 A). M. C. Hobart. 1800 w. *Am Mach*—Oct. 24, 1918. Experience of the Albaugh-Doyer Co. of Chicago.

How We Trained 5,000 Women (85837 A). C. U. Carpenter. Ills. 4000 w. *Ind Man*—May, 1918. Rapid and effective course at Dayton, Ohio, for operating machine tools and turning out high precision work.

The Employment of Women in Munition Factories (85526 A). O. E. Monkhouse. 2300 w. *Engng*—March 22, 1918. The essentials of successful methods of training.

The Problem of Women in War Industry (85846 A). C. E. Knoeppel. 3500 w. *Ind Man*—May, 1918. The necessity of replacing men called in war service by women.

War Work for Women (85344 A). Luther D. Burlingame. Ills. 5000 w. *Machy*—April, 1918. Comparison between men and women workers; suitable kinds of work; special methods and equipment; discipline, cost, etc.

See also **Employment, and Labor, under Regulation**.

Increased Employment of Women in the Industries (83980 A). 2500 w. *Machy*

REGULATION**Barred Zone**

—Feb., 1918. Problems involved in the substitution of women workers.

Our Experience With the Employment of Women (84097). David S. Earll. 1200 w. *Am Mach*—Feb. 7, 1918. Extract from a speech made at the New England Manufacturers' Conference. Great success.

Women in Engineering (84151 A). James Edgar. 1200 w. *Mech Wld*—Jan. 18, 1918. Effect of women's entrance into the workshops.

Employment of Female Labor in the Foundry (82796). W. L. Churchill. 2000 w. *Fndry*—Dec., 1917. Making core-making an attractive occupation. Good working conditions essential.

The Employment of Women in Railroad Shops (82742). Ills. 1500 w. *Ry Age Gaz*—Nov. 30, 1917. Results at some of the shops.

The Woman in Railroad Work (83011 A). Stuart Bready. Ills. 25 pp. *N. Y Rd Cb*—Nov. 16, 1917. Work which may be performed by female labor.

See also **Factories, under MECHANICAL ENGINEERING, Machine Works and Foundries**.

Working Schedule

Working Schedule for a Time Limit Job (89697 A). Donald A. Hampson. 1000 w. *Ind Man*—Nov., 1918. How a medium-sized shop arranged to maintain scheduled output by good management.

Workmanship

Workmanship and Efficiency—Discussion (89090 A). A. R. Allard. 1500 w. *Ind Man*—Oct., 1918. Critical discussion of views in C. W. Starker's article in the July issue.

Workmanship As An Efficiency Aim (87094 A). C. W. Starker. 2000 w. *Ind Man*—July, 1918. Efficiency methods often wrongly applied. Stimulate money making rather than pride in work.

REGULATION**Administration Bill**

The Administration Bill for Control of Railroads (83544). 6000 w. *Ry Age*—Jan. 10, 1918. Five-hundred-million appropriation.

After-the-War

Great Britain Working on After-the-War Problems (87014). Wingrove Bathon. 2500 w. *Eng News-Rec*—June 20, 1918. Work of the ministry of reconstruction and advisory council.

Agriculture

Industry and Agriculture (87568 A). W. G. Cass. 7 pp. *Cas Eng Mthly*—June, 1918. Evils of specialization.

Arbitration

Arbitration Act Reform (88139 N). 5000 w. *Cr Min West Aust, Mthly Jl*—April, 1918. Outlines directions in which Australian arbitration laws should be reformed.

Barred Zone

Barred Industrial Zone in Eastern States (87007 A). Map. 1500 w. *Iron Age*—June 20, 1918. No new manufacturing plans to be built in it because of present congestion and impossibility of getting coal.

REGULATION

Control Order

Business

Chicago Meeting of the Chamber of Commerce of the United States (86148). 2500 w. Am Mach—May 9, 1918. Extracts from speeches made by R. Goodwyn Rhett and Edward A. Filene.

The Business Machine at Washington (83297 A). Howard E. Coffin. 4000 w. Ind Man—Jan., 1918. War organization of the Government to direct industrial policy and to deal with labor.

Business Principles

Evolutionary Business Principles (87088 A). L. P. Alford. 2500 w. Ind Man—July, 1918. Brief report of principles declared by H. L. Gantt and C. E. Knoepfel before the U. S. Federal Trade Commission.

Cantonments

Utility Staffs at National Army Cantonments Organized on Military Basis (83455). John M. Goodell. 2500 w. Eng News-Rec—Jan. 3, 1918. Organization for Camp Meade utility service.

Capital and Labor

The Sins of the Capitalist (84662 A). 2500 w. Engng—Feb. 8, 1918. Editorial on the relations of capital and labor after the war.

"Zero" of Capital and Labor (85293 A). Lord Leverhulme, with discussion. 9500 w. Roy Soc Arts, JI—March 1, 1918. Profitable production and the creation of wealth. Progress of civilization, etc.

Chemical Industries

The Tariff Commission and Our Chemical Industries (82185 B). William S. Culbertson. 2800 w. JI Ind & Eng Chem—Nov., 1917. A study of electro-chemical industries, potash, explosions and nitrates, coal-tar dyes, etc.

Commerce

Post-War Commercial and Industrial Policy (86373 A). 2500 w. Engng—May 3, 1918. Editorial review of the recently issued committee report on methods of safeguarding British industry.

Commissions

See same heading under RAILWAY ENGINEERING, Conducting Transportation.

Compensation Acts

Failure to Comply with Compensation Acts (89188 A). Chelsa. C. Sherlock. 2000 w. Machy—Oct., 1918. Results of rejection of the acts.

Compensation

Comparison of Compensation Acts (84631 A). Chelsa C. Sherlock. 2500 w. Machy—March, 1918. Principles on which compensation acts are based and compensation allowed in each state.

Compensation Law

Court Decisions on Workmen's Compensation Law, August, 1916—May, 1918 (88174 N). 370 pp. N Y Dept Labor, No. 87 Part 1—June, 1918. Covers subjects of constitutionality and coverage.

Contracts

A Fair Royalty Contract for Employees (83052). Robert G. Pilkington. 2500 w. Am Mach—Dec. 13, 1917. Possible way of increasing income. Suggestions.

Control

Graphic Control of Production and Cost (85285 A). C. W. Starker. Charts. 3000 w. Ind Man—April, 1918. Shows how charts visualize performance.

War Industries Being Brought Under Modern Engineering Control (85157). Mont Schuyler. Chart. 2000 w. Am Mach—Feb. 21, 1918. The use of progress charts explained.

Unified Corporate Control of the Railways After the War (89583 A). A. C. Dennis. 1500 w. Eng News-Rec—Oct. 17, 1918. Would eliminate the wastes of competition without risking the dangers of permanent Government operation.

Bringing Capital and Labor Together (83292 A). J. P. Brophy. 1200 w. Ind Man—Jan., 1918. Suggests a board of control to determine hours of labor, wages, etc.

Control Bill

Progress of the Railroad Control Bill in Congress (84268). 6500 w. Ry Age—Feb. 15, 1918. Reported by Senate and House committees and discussion begun.

The Railroad Control Bill Is Reported (84163). 1800 w. Ry Age—Feb. 8, 1918. Amendments provide for termination of government control after fixed period.

The Railroad Control Bill in the Senate (84442). 9000 w. Ry Age—Feb. 22, 1918. Compensation, rate-making and period of control debated.

Railroad Control Bill Passed by the House (85151). 3500 w. Ry Age—March 22, 1918. Passed in form reported by conferees after elimination of restriction on state taxation.

Railroad Control Bill Passed by the Senate (84973). 6000 w. Ry Age—March 15, 1918. Period limited to 21 months after war.

Control Order

The Converter Plant Control Order, 1918, and Its Relation to Colliery Electrical Installations (88859 A). L. Fokes. 2200 w. Ir & CI Trds Rev—Aug. 16, 1918. Aims to obtain the maximum useful energy from every pound of coal.

REGULATION

Engineering Materials

Convict Labor

Report on Experimental Convict Road Camp, Fulton County, Ga. (85420 N). H. S. Fairbank, R. H. Eastham and W. F. Draper. Ills. 64 pp. U S Dept Ag, Bul 583—March 7, 1918. Details of the experiment and results.

Coöperation

The Babson Conference on Coöperation (806. A). 3500 w. Am Mach—Oct. 24, 1918. Report of the fifth annual conference of the Babson Statistical Organization at which were discussed questions concerning employer and employee.

Gear Makers decide on Closer Coöperation (89164). P. M. Heldt. 3500 w. Auto Ind—Sept. 26, 1918. Standardization plan involving all types of gears.

Report of Committee on Engineering Coöperation (82462 D). 13 pp. Am Soc Ht & Vt Engrs, J1—Oct., 1917. Includes paper by F. H. Newell, on "A Practical Plan of Engineering Coöperation."

Department of Labor

What the Department of Labor is Doing to Win the War (83297 A). Louis F. Post. 3500 w. Ind Man—Jan., 1918. How the Department is endeavoring to fulfill the requirements of employers in various kinds of war work all over the United States.

Draughtsmen

The Status and Remuneration of Draughtsmen (83381 A). 2200 w. Engng—Dec. 14, 1917. The work; how to raise the status of draughtsmen.

Economics

Food Conservation and the War (82623 B). Herbert C. Hoover. 2000 w. Am J1 Pub Hh—Nov., 1917. Outlines the necessities of the world at the present time.

Economy

World Need for Economy in Industry (87747 A). W. Rockwood Conover. 2000 w. Ind Man—Aug., 1918. A call to conserve material, labor and all kinds of effort to hasten recovery from war effects.

8-Hour Day

Report of Eight-Hour Day Commission (84029). 8500 w. Ry Age—Feb. 1, 1918. Wage increase resulting from Adamson law estimated at \$61,000,000.

Electrical Energy

Government Control of Water Power and Electrical Distribution Abroad (85502). L. W. Schmidt. 3500 w. Power—April 9, 1918. An outline of what has been done in Europe.

Emigration

Britain's Emigration Bill (87819). 2200 w. Naut Gaz—July 27, 1918. Objectionable features of the measure.

Employees

Keeping the Good Will of the Employee (83349). H. D. Murphy. 1200 w. Am Mach—Jan. 3, 1918. Its importance; ideas on the subject.

Employment

Coördinating of Federal, State and Municipal Employment Bureaus (85630 N). Henry Rogers Seager. 2000 w. Am Ec Rev—March, 1918. Considers the need of developing an adequate federal employment service.

Employment of Labor and the War (85634 N). 16 pp. Am Ec Rev—March, 1918. A general discussion.

Public Employment Offices in the United States (89404 N). John G. Herndon, Jr. 96 pp. U S Dept Labor, Bul 241—July, 1918. A study of their methods and practices, and information concerning them.

Federal Employment Bureau for Unskilled Labor in War Industries (88154). 1600 w. West Eng—Aug., 1918. Manufacturers working on war-contracts and employing over 100 workers must obtain unskilled labor through Federal Employment Service.

Employment Manager and Foreman (83306 A). Roy W. Kelly. 1200 w. Ind Man—Jan., 1918. Relationship; foremen's duties and responsibilities.

The Course of Employment in New York State from 1904 to 1916 (83009 N). 50 pp. N Y Dept Labor, No. 85—July, 1917. Study of the general problems of unemployment.

Engineering Appliances

The Overseas Distribution of Engineering Appliances (88384 N). Leonard Andrews, with discussion. 23 pp. Instn E E, J1—June, 1918. Suggestions for advancing British engineering industries.

Engineering Equipment

Supply Organization Expands 2250 Per Cent. to Equip Engineer Troops (83452). E. J. Mehren. 4000 w. Eng News-Rec—Jan. 3, 1918. Specification, design and purchase of a large variety of engineering equipment.

Engineering Materials

The Standardization of Engineering Materials and Its Influence on the Prosperity of the Country (87470 N). John Wolfe Barry. "James Forrest" lecture, 1917. Ills. 32 pp. Instn C E, Pro—May 2, 1917. The work, past, present, and future of the Engineering Standards Committee.

REGULATION

Industrial Problems

Engineers

Socialism, Unionism, and the Engineer (87203). J. Parke Channing. 2000 w. Eng & Con—June 26, 1918. Deals with the change in England since the war. The need of engineers studying the labor problems.

The Status of the Engineering Profession and Fees (88157 D). 2500 w. Okla Soc Engrs, Trans—Vol. IV, 1918. Responsibilities, service and compensation.

Express Merger

Merger of Express Companies (86640). 3000 w. Ry Rev—June 1, 1918. An agreement by which the Adams, American, Wells Fargo, and Southern express companies have been merged into one corporation to be known as Federal Express Company.

Farm Bureaus

The Relation of the Railroad to the Farmer (84162). George A. Cullen. 2000 w. Ry Age—Feb. 8, 1918. Far-reaching results from developments of farm bureaus in New York State.

Farm Labor

Plan of the Department of Agriculture for Handling the Farm Labor Problem (85632 N). E. V. Wilcox. 5000 w. Am Ec Rev—March, 1918. Explains conditions and gives suggestions for meeting the necessity.

Food Administration

Food for the War (86800). H. C. Hoover. 5500 w. West Eng—June, 1918. Address before the Pittsburgh Press Club on April 18. The need of coöperation between producers, manufacturers, distributors, and consumers of food.

Food for the War (86395). H. C. Hoover. 6000 w. Min & Sci Pr—May 18, 1918. Speech before Pittsburgh Press Club. The aims and the necessity for coöperation.

Food Control

Government Control of the Wheat Trade in the United States (85015 N). William M. Duffus. 25 pp. Am Ec Rev—March, 1918. Analysis and discussion of the United States Food and Fuel Control Act, passed Aug. 10, 1917.

Food Wastes

Food Wastes—Some Causes and Remedies (86311 B). Lucius P. Brown. Ills. 25 pp. Fkn Inst, JI—May, 1918. Wastes in harvesting, in manufacture, in transit and distribution, and in the kitchen.

Foreman

The Foreman's Position (84013 A). James Edgar. 1100 w. Mech Wld—Jan. 11, 1918. Requirements for success.

Foreign Workmen

Getting the Foreign Workmen's Viewpoint (85803 D). Prince Lazarovich-

Hreblianovich. 3500 w. A I M E, Bul—April, 1918. Importance of investigating the conditions and environment of the foreign workman in his home lands, and of studying the moral element.

French Railways

See France, under RAILWAY ENGINEERING, *Conducting Transportation*.

Fuel Administration

Five Coal-less Days and Ten Heatless Holidays (83815). 3000 w. Ry Age—Jan. 25, 1918. Fuel Administration orders a suspension of industries.

Garfield Defends Order That Shut Down Industries (83826). 2000 w. Cl Age—Jan. 26, 1918. Text of defense, with interview by Floyd W. Parsons.

Fuel Distribution

The "Philadelphia Plan" of Coal Allotment (89636). Jerome S. Carson. 13 pp. Ht & Vtg Mag—Oct., 1918. A highly-successful scheme of fuel distribution.

Fuel Saving

War Conservation of Power and Light (88128 A). Charles E. Stuart. 3500 w. E Cb Phila, JI—Aug., 1918. Plans laid out by the Bureau of Conservation of the U. S. Fuel Administration.

German Trade

World Economics and the Kiel Institute (85707 A). 1000 w. Engr—March 22, 1918. Account of the laying of the cornerstone of the "Institute for Sea Trade and World Economics," and the proposed work of the Institute.

Government Aid

Engineering Societies' War Activities (83478). 2500 w. Elec Wld—Jan. 5, 1918. Ways in which national technical societies have aided government.

Immigration

A Comprehensive Immigration Policy and Program (84881 A). Sidney L. Gulick. 3500 w. Sci M—March, 1918. Outlines a plan for the regulation and restriction of immigration.

Industrial Order

Widespread Closing Down of Industry (83784 A). 13 pp. Iron Age—Jan. 24, 1918. To give coal to vessels, relieve freight congestion and fuel shortage.

Industrial Peace

Industrial Peace—First Essential in Winning War (82591). Sir Stephenson Kent. 2500 w. Auto Ind—Nov. 22, 1917. A concise summary of the British situation and the labor problem.

Industrial Problems

Presidential Address Before the Iron and Steel Institute (86374 A). Eugene Schneider. 5500 w. Engng—May 3, 1918. Industrial problems to be met after the war, particularly in the metallurgical field.

Industrial Relations

REGULATION

Labor

Problems of Industrial Reconstruction (84674 A). 2200 w. Engr—Feb. 1, 1918. Work of the Ministry of Reconstruction.

Industrial Relations

Mining Engineers Consider Industrial Relations (84705). R. Dawson Hall. 2000 w. Cl Age—March 2, 1918. Serial, 1st part. Reviews recent sessions of A. I. M. E., discussing industrial problems.

Industry

Some Problems and Suggestions for the Readjustment of Industry (87599 N). David Carnegie. 10 pp. Can Min Inst, Bul—July, 1918. Serial, 1st part. Considers how to secure remunerative trade without unrestricted competition in the present number.

Kitchens

National Kitchens (86482). 2000 w. Times Engng Supp—Apr. 26, 1918. Choice of equipment. Apparatus used and systems described.

Labor

Adjustment of Labor's Demands During Federal Control of Railroad Operation (85642 D). Glenn E. Plumb. 11 pp. An Am Acad—March, 1918. Rights of capital and of labor in railroad properties.

Labor's Disloyal Minority (89017). Charles L. Underhill. 12 pp. Open Shop Rev—Sept., 1918. A speech before the Mass. Constitutional Convention in opposition to a proposed amendment which would deprive the courts of power to issue injunctions in labor disputes.

Recent Developments in the British Labor Movement (88726 N). G. D. H. Cole. 20 pp. Am Ec Rev—Sept., 1918. Explains the character of British trade unionism and discusses prospects that will follow the return of peace.

Labor Board's Award in Bethlehem Case (88073 A). 2000 w. Iron Age—Aug. 8, 1918. Decision and award in full. Summary of investigation of conditions.

Strong Plea for Permanent Adjustment (88074 A). 2500 w. Iron Age—Aug. 8, 1918. Abstract of brief filed with National War Labor Board. Bridgeport manufacturers protest against abandoning methods of demonstrated efficiency.

Labor Administration (89535 A). Edward T. Elbourne. 3500 w. Engr—Sept. 20, 1918. Serial, 1st part. First of a series of articles based on actual factory practice and experience.

A Priority System for Labor Recruiting (87325 A). 2000 w. Iron Age—July 4, 1918. Preferential industries to be favored.

Labor and Capital: What Do They Want? (87569 A). F. T. Clapham. 5

pp. Cas Eng Mthly—June, 1918. The demands of each; the need of their joining hands.

Labor Efficiency in Winning the War (87680 D). 46 pp. An Am Acad—July, 1918. Eight articles by authors of commanding positions discussing various phases of the subject.

The Company and Its Employees (87538). Sidney J. Jennings. 1200 w. Min & Sci Pr—July 13, 1918. Part of presidential address at Butte, Mon. Origin of the company in Roman law; early English legislation; methods of correcting abuses.

The Mission of the United States Employment Service (87640). James A. Metcalf. 2000 w. Mfrs Rec—July 18, 1918. Explains the object of the service.

The Problem of a Chinese Labor Army (87327). Courtenay De Kalb. 2500 w. Mfrs Rec—July 4, 1918. Problems in connection with the importation of Chinese labor.

Development of Community Interest (86072). Charles F. Willis. 2000 w. Eng & Min J—May 4, 1918. Value as a phase of welfare work for western metal mines.

Post-War Prospects (86246 A). H. Kay. 1000 w. Mech Wld—Apr. 26, 1918. The labor question and the problems to be met.

Crux of the War Situation is Labor (83536 A). Elbert H. Gary. 3000 w. Iron Age—Jan. 10, 1918. Address before the Commercial Club of Chicago. Favors bringing men from the Orient.

Fifth Annual Report of the Secretary of Labor—Fiscal Year Ending June 30, 1917 (83645 N). 150 pp. U S Gov Print Office—1917. Mediation in labor disputes, and other work of the Dept.

Monthly Review of the U. S. Bureau of Labor. Statistics (83795 N). 256 pp. U S Dept Labor—Dec., 1917.

Railway Labor Conditions (83758 A). 2500 w. Engng—Dec. 28, 1917. Developments in connection with rates of wages in Great Britain. Editorial.

Reducing Labor Turnover in Our Shops (83351). Fred H. Colvin. 2200 w. Am Mach—Jan. 3, 1918. Different phases of the question.

Shop Stewards (83764 A). 1500 w. Engr—Jan. 4, 1918. Discusses the recent agreement in England to recognize the shop stewards.

Unionizing Industry as a War Measure (83538 A). Walter Drew. 1800 w. Iron Age—Jan. 10, 1918. Its dangers.

Employment in Small Plants (85292 A). Allen L. Adams. 2000 w. Ind Man—April, 1918. Suggestions for securing

Labor Laws

congenial relations and development.

Guiding the Workman's Personal Expenditures (84945). C. J. Shower. Ills. 1800 w. Auto Ind—March 14, 1918. How Ford reduced turnover 350 per cent.

Labor Conditions With Reference to the War (84885 A). Francis Tyson. 2500 w. Sci M—March, 1918. Outlines the courses of labor shortage and expedients available for the solution of the problem.

The Government War-Labor Policy (85177). 1800 w. Am Mach—March 21, 1918. Outlines the tentative proposals of the Administration.

Forbids Time Studies and All Bonuses (86843 A). 2500 w. Iron Age—June 13, 1918. House overrules its Committee on Military Affairs and votes for limitation of output.

The Efficient Utilization of Labor in Engineering Factories (With Special Reference to Women's Work) (86723 A). Ben H. Morgan. Read before Instn. of Mech. Engrs. (Abridged.) 4000 w. Engr—May 17, 1918. General considerations regarding the employment of women; standardization, etc.

The Problem of Labor Turnover (86865 N). Paul H. Douglas. 11 pp. Am Ec Rev—June, 1918. Examines its nature, extent, cost, and its causes and remedies.

Adjustment of Labor to War Needs (82863 A). 1800 w. Iron Age—Dec. 6, 1917. New Bureau, organized by Council of National Defense.

Dilution of Skilled Labor, and Women in Industries (82713). G. H. Bailie. 2000 w. Am Mach—Nov. 29, 1917. How Great Britain is meeting various labor problems.

Union Scale of Wages and Hours of Labor, May 15, 1916 (83008 A). 287 pp. U S Dept Labors Bul 214—Sept., 1917. Reports higher wages than any previous year.

Labor Laws

New York Labor Laws Enacted in 1918 (88175 N). 66 pp. N Y Dept Labor, No. 88—June, 1918. Text of amendments to the labor law and workmen's compensation act.

Effect of Workmen's Compensation Laws in Diminishing the Necessity of Industrial Employment of Women and Children (85891). Mary K. Conyngton. 160 pp. U. S. Dept Labor, Bul 217—Dec., 1917. Investigation of the effect of workman's compensation laws as compared with employers' liability laws.

Labor Legislation

Decisions of Courts Affecting Labor; 1916 (82888 A). Lindley D. Clark and Augustus P. Norton. 335 pp. U S

REGULATION

Dept Labor—Sept., 1917. Review, text and summaries of decisions.

Labor Problem

Labor and Capital (88826 A). Harry Tipper. 1800 w. E Cb Phila, J1—Sept., 1918. History of the labor problem; ideals of labor and capital; political, industrial and social aspects of the problem.

The Problem of Industrial Unrest (88715 A). A. J. Butler. 2500 w. Aust Min Std—July 18, 1918. On conditions in Australia.

The Problem of Industrial Unrest (88793 A). Meredith Atkinson. 1500 w. Aust Min Std—July 25, 1918. Relation between economics and ethics.

Labor Turnover Records and the Labor Problem (82258 A). Richard B. Gregg. 2000 w. A S M E, J1—Nov., 1917. Advocates application of analysis to labor turnover.

Fostering the Shop Spirit (82733 A). W. E. Freeland. Ills. 2500 w. Iron Age—Nov. 29, 1917. Helpful movements for the development of employee and community interest.

Administration of War Labor Problems (85277 A). William B. Wilson. 2500 w. Ind Man—April, 1918. Causes of labor difficulties and unrest, with recommendations as to remedies. Outlines the organization of the Department of Labor.

Labor Turnover

Methods of Arriving at Labor Turnover (85289 A). J. M. Van Harlingen and T. J. Dwyer. 1500 w. Ind Man—April, 1918. Results of a number of methods.

Law

See same heading under Welfare and Safety.

Legislation

Legislation for Engineers (88663). Frederick H. Peters. Read before Engng. Inst. of Canada. 3000 w. Can Engr—Sept. 5, 1918. Considered with reference to Canada.

Man Power

Man Power (86410 D). J. Parke Channing. 3300 w. A I M E, Bul—May, 1918. Labor problems in the United States.

Manufacturing

Manufacture After the War (83917). 2000 w. Times Eng Supp—Nov. 30, 1917. Problems of federation and association in England after the war.

Concentrating for Real War Work (82578 A). 2500 w. Iron Age—Nov. 22, 1917. Bureau of manufacturing industries to be organized.

Metallic Minerals

Federal Control of Metallic Minerals (84337 D). 6000 w. A I M E, Bul—Feb., 1918. Text of proposed bill with abstract.

REGULATION

Power Law

Minerals

The War-Minerals Bill (87419). 8000 w. Min & Sci Pr—July 6, 1918. Testimony of Walter R. Ingalls before the Committee on Mines of the House of Representatives.

Missouri Laws

Missouri Tax Laws and Measures (84199). William F. Orthwein. 4000 w. Telephony—Feb. 9, 1918. Late laws affecting telephone companies.

Organization

Shop Organization: A Simple Scheme (88823). W. E. John, with discussion. Read before Aeronautical Soc. 6000 w. A A Wkly—Sept. 16, 1918. Outlines a scheme for the organization of a factory.

An Industrial Democracy (87927 A). Ellsworth Sheldon. 1500 w. Am Mach—Aug. 1, 1918. Account of an interesting factory organization at the plant of Wm. De Muth & Co., Richmond Hill, N. Y.

Trusts and Combines (88182 B). E. T. Good. 2500 w. Cas Eng Mthly—July, 1918. Growth of export trade.

Lay Down Lines of Organization for Contractors' Association (89250 A). 1800 w. Eng News-Rec—Oct. 3, 1918. Objects of new national body are broad in scope.

The Importance of Organization Laws in This World Crisis (83285 A). C. E. Knoeppel. 700 w. Ind Man—Jan., 1918. A plea for the study of principles and laws.

Washington Making Preparations Against Industrial Unrest (84242). Mont Schuyler. 2000 w. Eng News-Rec—Feb. 14, 1918. Employment management being introduced in all departments.

Milwaukee's Organization for War (87748 A). Willits Pollock. 2200 w. Ind Man—Aug., 1918. Organization of civic and industrial activities on the general staff system.

"The Whitley Scheme": A Step Toward Democratising Industrial Relations (86296 N). C. V. Corliss. 5000 w. Can Min Inst, Bul—May, 1918. Explains the scheme and some of its ideals.

Packers

Suggests Railroad Administration Control for Packers (88249). 2500 w. Ry Age—Aug. 16, 1918. Report of Federal Trade Commission charges the five largest packers with operating a monopoly.

Paper Mill

Old Paper Mill Rebuilt for Efficient Operation (84793). Joseph Meltzer. Ills. 4500 w. Eng News-Rec—March 7, 1918. Solutions of problems of routing, machinery, structure and fittings.

Patents

Patents (88146). Robert Hadfield. Excerpts from presidential address to Soc. of British Gas Industries. 4000 w. Can Engr—Aug. 8, 1918. Importance of wise and liberal patent laws American and English practice, etc.

Paternalism

The Dangers of Paternalism in Government (89615 A). Otto H. Kahn. 5500 w. Eng & Min JI—Oct. 19, 1918. Address, slightly condensed, before the convention of Am. Bankers' Assn., at Chicago, Sept. 27, 1918.

Post-War

British Post-War Industrial Plans (88098). 2000 w. Auto Ind—Aug. 8, 1918. Recommendations as to methods to be pursued during the reconstruction period.

Power

See same heading under Management.

Mastering Power Production—VIII (88448 A). Walter N. Polakov. 5000 w. Ind Man—Sept., 1918. Detailed analysis of operation and efficiency.

See same heading under Management.

Mastering Power Production. V. (85845 A). Walter N. Polakov. Ills. 3500 w. Ind Man—May, 1918. Work to be done before operations can be standardized and tasks set.

Mastering Power Productions—IV (85283 A). Walter N. Polakov. 4500 w. Ind Man—April, 1918. Relations of wages and Power to the labor problem.

See same heading under Management.

Mastering Power Production—II (83947 A). Walter N. Polakov. 3500 w. Ind Man—Feb., 1918. Deals with general principles of arrangement and installation of plant equipment.

Mastering Power Production — III. (84566 A). Walter N. Polakov. 3000 w. Ind Man—March, 1918. Third article of a serial showing the importance of mastery of materials to secure success.

Mastering Power Production (83290 A). Walter N. Polakov. 3000 w. Ind Man—Jan., 1918. Serial, 1st part. Development of the principle of producing for the common good.

Power Economy

Power Economy An Essential Factor in Winning the War (85288 A). W. Rockwood Canover. 4000 w. Ind Man—April, 1918. Points in the economy of power production from the viewpoint of the power station and shop.

Power Law

Action Nearer on \$200,000,000 Power Law (89176). 5000 w. Elec Wld—Sept. 28, 1918. Prospects of passage of meas-

Public Utilities

ure to provide government credit for enlarging power resources.

Dr. H. A. Garfield for \$200,000,000 Power Law (89009). 3000 w. Elec Wld—Sept. 21, 1918. Urges the importance of passing the emergency war plant act to provide adequate power supply for coal production.

Publicity

Pitiless Publicity in Business (87165 A). 700 w. Ind Man—July, 1918. Editorial on H. L. Gantt's testimony before the Federal Trade Commission advocating fullest publicity.

Public Utilities

Commission View of Utility Control (88069). Charles E. Elmquist. 4000 w. Telephony—Aug. 3, 1918. Commission control of public utilities.

What Commissions Are Doing on Rates (87824). 2000 w. Elec Wld—July 27, 1918. Conditions in California.

Commission Control of Utilities (87417). O. F. Berry. Read before convention of U. S. Tel. Assn. 4500 w. Telephony—July 6, 1918. Deals with telephone interests in Illinois, as a typical state.

See same heading under Finance and Costs.

The Public Utilities and the War (85355). Charles W. McKay. 2500 w. Elec Rev, Chi—March 30, 1918. Need of higher rate schedules.

Logic of Public Utility Consolidations (85213). Clarence P. Fowler. 2000 w. Elec Wld—March 23, 1918. Combinations are economical and a public benefit.

Effects of War Conditions on Cost and Quality of Public Utility Service (83564). 2000 w. Elec Ry JI—Jan. 12, 1918. Extra operating expense should be considered in modifying rates.

Practical Measures for Securing Greatest Economy in Public Utility Plant Operation (83499 A). Charles Brossmann. 2500 w. Mun Eng—Jan., 1918. Serial, 1st part. Specific recommendations for increasing efficiency.

Public Utility Rates (82262 A). H. S. Cooper. 6500 w. Gen Elec Rev—Nov., 1917. Factors which influence rates. Shows that inspection of rate schedules by the comparison method is fallacious.

Regulating Public Utilities in Ohio (82229). 3500 w. Elec Ry JI—Nov. 3, 1917. Deals with the organization of the Ohio Public Utilities Commission and shows the varied kinds of work being carried on.

Railroad Bill

The Railroad Bill in the Senate (84450). George P. McLean. 4500 w. Ry Rev—

REGULATION**Rate Regulation**

Feb. 23, 1918. Address opposing government possession and control of railways.

The Railroad Bill Passed by the Senate (84648). 4800 w. Ry Age—March 1, 1918. Few changes from original form.

Railway Contracts

Urges That Draft Contract for Federal Railway Operation Is Unfair (87954 A). 2500 w. Eng News-Rec—Aug. 1, 1918. Features of the tentative draft of agreement not acceptable.

Railroad Hearings

Railroad Hearings Before the Senate Committee (83470 A). 2500 w. Ry Age—Jan. 4, 1918. (Special No.) Interstate Commerce Commission questioned.

Railroad Laws

Status of Existing Railroad Laws and Regulative Agencies Under Federal Control (85646 D). Edgar Watkins. 1200 w. An Am Acad—March, 1918. Considers regulations to promote competition.

Failures and Possibilities in Railroad Regulation (85638 D). T. W. Van Metre. 4500 w. An Am Acad—March, 1918. A discussion of difficulties and urgent needs in railway operations.

Reconstituting Railroad Regulation (85649 D). George A. Post. 1000 w. An Am Acad—March, 1918. Considers individual initiative and adequacy of revenue essential factors.

Railroads

Supreme Court Decisions Affecting Railroads (83819). 3000 w. Ry Age—Jan. 25, 1918. Abstracts of decisions in the Illinois and the Texas cases.

Railroad Securities

Desirable Scope and Method of Federal Regulation of Railroad Securities (85653 D). Max Thelen. 10 pp. An Am Acad—March, 1918. The desirable scope and method of regulation.

Railway Labor

General Order No. 8, Governing Labor Conditions (84647). 1200 w. Ry Age—March 1, 1918. Statement outlining Director General McAdoo's desires as to railway labor.

Railways

Railway Regulation and Control (82331). 3000 w. Ry Age Gaz—Nov. 9, 1917. Hearings at San Francisco before the Congressional Joint Committee on Interstate Commerce.

Rate Regulation

Cost of Service the Chief Factor in Rate Regulation (88576 A). William G. Raymond. 3000 w. Eng News-Rec—Sept. 5, 1918. Explains method believed to be in accord with court decisions.

REGULATION

Trade

Rates

How Could Nationalization of Rate Regulation Best Be Accomplished? Martin S. Decker. Also, Legal Questions Involved in Nationalization of Rate Regulation (85656 D). William E. Lamb. 23 pp. An Am Acad—March, 1918. Elements of successful regulation of rates.

Necessity for Exclusive Federal Control Over State and Interstate Rates (85655 D). Edgar J. Rich. 15 pp. An Am Acad—March, 1918. The standard of service must be determined by national authority, and rates must be adjusted with reference to the service.

The Point Now Reached in the Federal Regulation of Interstate Rates (85654 D). J. A. Little. 12 pp. An Am Acad—March, 1918. Reviews the history of federal authority over interstate commerce.

Rate Setting

Time Studies for Rate Setting on Gisholt Boring Mills (87096 A). Dwight V. Merrick. Ills. 3000 w. Ind Man—July, 1918. Serial, 1st part. Preparation of a boring mill for work to be done, giving tabulated data.

Reconstruction

Readjustment and Reconstruction Commission (86635). Wingrove Bathon. 1600 w. Elec Wld—June 1, 1918. Serial, 1st part. Suggests the creation of an agency to deal with the inevitable after-war problems.

Address by the Right Hon. Christopher Addison, M. D., M. P., Minister of Reconstruction (85719 N). 15 pp. N E C Instn, Trans—March, 1918. Organization of trades, reconstruction, standardization, etc.

Sales Engineering

Ethics of Sales Engineering (87177). Walter G. Stephan. 2000 w. Power—June 25, 1918. Discusses the ethics of salesmanship from various viewpoints.

Small Industries

The Small Industry in a Democracy (87305 A). George H. Haynes. 6500 w. A S M E, JI—July, 1918. Some of the advantages of small industries, and requirements to insure their protection and opportunities for development.

Specialization

Specialization in Industry (86717 A). 2500 w. Engr—May 10, 1918. The growth of this tendency in modern industry and its disadvantages, and possible remedies.

Standardization

La Standardisation Technique Et Industrielle (86457 C + D). P. Toulon. 2200 w. Bul Soc D'Encouragement Pour L'Industrie—Jan.-Feb., 1918. Technical and industrial standardization. Review of

advantages of international agreement on the subject.

Standardized Occupations and Rates (85899 A). W. D. Stearns. 1800 w. Ind Man—May, 1918. Methods adopted by the Westinghouse Electric and Manufacturing Co.

Gear Makers Discuss Standardization (89146 A). 4000 w. Iron Age—Sept. 26, 1918. Summary of papers at meeting of Am. Gear Mfrs. Assn. Standardization plans, committee reports, etc.

Standards

International Standard a By-Product of the Great World War (85294 A). Herbert T. Wade. 4500 w. Ind Man—April, 1918. An appeal to carry on the process of standardization for the days of peace.

State Control

Evils of State Control (85149). 4000 w. Naut Gaz—March 14, 1918. Liverpool Steamship Assoc'n does not approve shipping policy of British Government.

State Regulation

State Regulation of the Securities of Railroads and Public Service Companies (85652 D). Mary L. Barron. 24 pp. An Am Acad—March, 1918. Powers and procedure of public service commissions in relation to security issues of public service corporations.

Steel

First of Government Regulation in Steel (83445 D). 4500 w. Iron Age—Jan. 3, 1918. (Special No.) Record ingot production.

Steel Dumping

The Economics of Steel Dumping (87342 A). 1800 w. Engng—May 31, 1918. Editorial on the economics of the practice as pursued by Germany.

Steel Situation.

Government Steel Requisitions Are On Safe Side (87212). W. H. Taylor. 3000 w. Eng News-Rec—June 27, 1918. From Chicago address before conference of publishers and manufacturers. Considers Russia the key to post-war trade.

Strikes

Strikes and Some Reflections (84696 N). 8 pp. Cham Mines W Aust, Mthly JI—Nov., 1917. On the strikes that lasted three months in Australia.

Time Zones

Proposed New Boundaries for Standard Time Zones (87935). Emerson W. Judd. 2500 w. Ry Age—Aug. 2, 1918. Plan for relieving all large cities of the double time standard.

Trade

Trade Parliaments and Their Work (86362 A). Ernest J. P. Benn. 1000 w. Elec'n—Apr. 26, 1918. Serial, 1st part.

Trade Bureau

Work waiting to be done by Trade Parliaments.

Trade Bureau

The British Trade Bureau (88181 B). Alexander Jack. 2000 w. Cas Eng Mthly. July, 1918. The problem of developing export trade.

Trade Secrets

Secrecy Versus Coöperation (88459 A). Robert Mawson. 1200 w. Ind Man—Sept., 1918. Methods often practiced in the days of small shops.

Tariff Commission

The Tariff Commission and Its Operation with Reference to the Chemical Schedule (82186 B). Grinnell Jones. 2200 w. J1 Ind and Eng Chem—Nov., 1917. The work of the Commission.

Taxes

The Income Tax (86804 A). Carl G. Barth. 5500 w. E Cb Phila, J1—June, 1918. Serial, 1st part. An engineer's analysis with suggestions.

Automobile Tax Hearing Before the Ways and Means Committee (86890). 2500 w. Auto Ind—June 13, 1918. Congressmen favor higher tax. Statement made by Alfred Reeves before the ways and means committee.

U. S. Railroads

Is It Wise to Unify the Railways Nationally? (87512). Frank W. Noxon. 2500 w. Ry Age—July 12, 1918. (Sec. 2.) A study of the aims desirable in any re-organization of U. S. railways.

The Future of the Railroads of the United States (87510). F. J. Lisman. 5000 w. Ry Age—July 12, 1918. (Sec. 2.) A suggestion for a regional system under private ownership with government representation.

Wages

McAdoo Puts Wage Increase Into Effect (86629). 3000 w. Ry Age—May 31, 1918. Increase of wages for railway employees by order of the director general.

Wage Increase for Railway Men (86963 A). Ills. 3000 w. Ry Mech Engr—June, 1918. A minimum hourly wage of fifty-five cents for mechanics allowed.

War Board

Accomplishments of the Railroad's War Board (83471 A). 3500 w. Ry Age—Jan. 4, 1918. (Special No.) Report to Senate Committee tells also of what it had hoped to do.

War Industries

War Industries Board to Be Central Agency for Mobilizing Nation's Resources (83775). 1500 w. Eng News-Rec—Jan. 24, 1918. Plan outlined by Secretary Baker.

Germany's Contribution to Our War

REGULATION

Women Workers

Preparation (83438 D). Ills. 1500 w. Iron Age—Jan. 3, 1918. (Special No.) A Bridgeport, Conn., plant, financed by Germany, for the production of shrapnel, taken over by U. S. government.

War Work

Lining Up War-Work Possibilities of the Various Industries (88471 A). C. W. Stark. 1500 w. Am Mach—Aug. 29, 1918. A new government agency.

Women Workers

Improved Equipment Permits Employment of Additional Women Workers (87652). Ills. 2000 w. Auto Ind—July 18, 1918. Lifting devices installed in a Detroit shop to lighten work.

American Women in War Industry—II (87098 A). C. E. Kneoppel. 4500 w. Ind Man—July, 1918. Problems of living conditions, state laws, coöperation of labor agencies and the post bellum period.

Some Problems of Female Labor (86889). 2000 w. Auto Ind—June 13, 1918. Discusses kinds of work, wages, demands, etc.

Women's Place in the Electrical Industry (86785). Ills. 2000 w. Elec Wld—June 8, 1918. Their part in the production of electrical apparatus, and in central station work.

Women as Substitutes for Men Employees (82161 A). F. W. Brooks. Ills. 3000 w. AERA—Oct., 1917. Gives opinions of railway managers in Great Britain and Italy.

One Labor-Shortage Problem Solved—Women in Machine Shops a Success (83530). 2000 w. Eng News-Rec—Jan. 10, 1918. Efficient work on machine tools.

The Woman Worker. John W. Upp. Also, Psychology of Environment. C. B. Lord. With discussion of the two papers (83334 A). Ills. 7000 w. A S M E, J1—Jan., 1917. Problems concerning women.

Women Fill Men's Places in Shops (83729 A). Articles by D. C. Buell, Harvey D. Wolcomb, and Margaret Lampert. 4500 w. Ry Mech Engr—Jan., 1918. Suggestions for their training.

Woman Power (83924). 1100 w. Times Engng Supp—Nov. 30, 1917. Account of the Exhibition of Women's Work.

Women in German Foundries (83771 A). From paper by Kurt Abeking in *Stahl und Eisen*. Ills. 1500 w. Ir & Cl Trds Rev—Dec. 28, 1917. Considers kinds of work and ways of instruction.

Women's Labor in British War Industries (83662 A). L. H. Quin. Ills. 4000 w. Iron Age—Jan. 17, 1918. Its great scope and problems involved; wages, efficiency and working conditions.

WELFARE AND SAFETY

Benefit Association

Women Workers

See same heading under **MANAGEMENT**.
 Women Workers in Machine Shops in Great Britain (84627 A). 1200 w. Machy—March, 1918. Conditions, training, etc.

Workers

Changing from Male to Female Help (85291 A). W. L. Churchill. 1800 w. Ind Man—April, 1918. Care in selection, supervision, compensation, etc.

WELFARE AND SAFETY

Accident Prevention

Progress in Accident Prevention (88786). 2500 w. Cl Age—Sept. 12, 1918. What the National Safety Council has accomplished.

Benefits of Accident Prevention in Contracting (89120). F. S. Robinson. Abstract of paper before the Natl. Safety Council. 1500 w. Eng & Con—Sept. 25, 1918. Account of work aiming to control accidents.

Greater Need for Accident Prevention (89145 A). 2500 w. Iron Age—Sept. 26, 1918. Summary of papers at St. Louis convention of the Natl. Safety Council on the special demand for safety campaigns.

Safety Engineering and Accident Prevention in Construction Work (89119). Leo D. Woedtk. Abstract of address before Natl. Safety Council. 4000 w. Eng & Con—Sept. 25, 1918. Suggestions for carrying out this work.

Accident Prevention Methods That Work (87744 A). William Lamkie. 600 w. Ind Man—Aug., 1918. How attention to minor details may prevent accidents.

Accident Prevention in the Telephone Field (82306 A). J. F. Naylor. 2500 w. Tel Engr—Nov., 1917. Problem largely one of educating employees.

Accident Prevention in the Textile Industry (82259 A). David S. Beyer. Ills. 3500 w. A S M E, Jl—Nov., 1917. Methods of mechanical protection are described, and factors causing accidents discussed.

Accident Prevention in the Textile Industry (82926 A). David S. Beyer. Ills. 18 pp. A S M E—Dec., 1917. Guards and other safety appliances.

Securing and Sustaining the Coöperation of Trainmen in Accident Prevention Work (83241 A). H. A. Nicholl. 3000 w. Sfty Eng—Dec., 1917. Suggests methods.

Accidents

Industrial Accidents (87143). 1000 w. Times Engng Sup—May, 1918. Results of an investigation by Dr. H. M. Vernon of the causes of accidents in British munition works.

What Each Mine Operator Can Do to Aid Accident Statistics (89218 A). A. H. Fay. 2000 w. Sfty Eng—Oct., 1918. The

object of statistics, uniform records, regulations, etc.

Accidents on Overhead Traveling Crane Runways (82390). 1800 w. Trav Stand—Nov., 1917. Calls attention to infrequent accidents which occur in crane work.

Accidents in the Home (87447). 2200 w. Trav Stand—June, 1918. Causes and methods of prevention, with statistical data.

Workshop Accidents (87727). 2000 w. Times Engng Sup—June, 1918. Report of British committee on health of munition workers.

Accident Problems of Electric Companies (83239 A). P. Frank Day. 1500 w. Sfty Eng—Dec., 1917. Abstract of paper at Welfare and Efficiency Conference. Plant hazard, human element, lamp trimmers.

Agriculture

The Palate of Civilized Man and Its Influence on Agriculture (84990 B). David Fairchild. Ills. 18 pp. Fkn Inst, Jl—March, 1918. Taste and fashion in food and their influence.

Army Subsistence

How France Subsists Her Armies at the Front (82531 B). Translated from *L'Illustration*. Ills. 15 pp. Prof-Mem—Nov.-Dec., 1917. Demand and supply methods of transport, etc.

Benefit Association

The Employees' Benefit Association (86564 A). W. L. Chandler. 4000 w. Ind Man—June, 1918. Fifth article of a series. Gives charts for various combinations of dues paid.

The Employees' Benefit Association—IV (85282 A). W. L. Chandler. 3500 w. Ind Man—April, 1918. What benefits are right? Question of supervision of beneficiaries.

The Employees' Benefit Association—VI (87090 A). W. L. Chandler. 4000 w. Ind Man—July, 1918. Final instalment of series deals with means of measuring results.

The Employees' Benefit Association—III. (84572 A). W. L. Chandler. 5500 w. Ind Man—March, 1918. Services to be rendered and benefits paid.

The Employees' Benefit Association (83968 A). W. L. Chandler. Charts.

Consult Classification of the Index. See page 9.

Betterment

6000 w. Ind Man—Feb., 1918. Second part of serial. Its relations to employee and employer and its management. Sick benefits, insurance, etc.

The Employers Benefit Association (83291 A). W. L. Chandler. Illus. 6000 w. Ind Man—Jan., 1918. Serial, 1st part. How to solve its problems.

Betterment

The Life of a Mining Community (89675 A). Charles F. Willis. Ills. 2200 w. Eng & Min JI—Oct. 26, 1918. Efforts made by a large mining corporation to better the living and social conditions for employees.

Blast Furnaces

Occupational Hazards at Blast-Furnace Plants and Accident Prevention (84372 A). Frederick H. Willcox. Ills. 140 pp. U S Bur Mines—Bul. 140. Based on records of accidents in Penn. in 1915.

Boys

The Boy in Industry—A British Effort to Protect Him (89139 A). Robert R. Hyde. 400 w. Ind Man—Oct., 1918. Qualities needed for successful leadership in boy welfare work.

Bush Terminal

What the Bush Terminal Is Doing for Its Employees (83307 A). Daniel Bloomfield. 1500 w. Ind Man—Jan., 1918. Account of work for the protection, health and thrift of employees.

Camp Sanitation

Camp Sanitation in Trench Warfare (87186 B). 10 pp. U S Art JI—Jan.-April, 1918. Details of methods adopted.

Canteens

The Cost of Works' Canteens (84020 A). Ills. & plate. 2500 w. Engng—Jan. 11, 1918. Cost of erection, equipment and maintenance of two English canteens.

The Establishment and Management of Engineering Works' Canteens (83070 A). Arthur F. Agar. Read before Manchester Assn. of Engrs. 3000 w. Engng—Nov. 30, 1917. Their arrangements for feeding workers.

Compensation

See same heading under Regulation.

Contracting

Safety Engineering in General Contracting (85275 A). L. D. von Woldtke. 1000 w. Sfty Eng—March, 1918. Methods.

Cranes

Safety Standards for Cranes (86268 A). Ills. 3500 w. Sfty Eng—April, 1918. Code and rules of the Industrial Board of the Penn. Dept. of Labor and Industry.

Crippled Soldiers

The Duty of the Employer in the Reconstruction of the Crippled Soldier (87614 D). Douglas C. McMurtrie.

WELFARE AND SAFETY**Dust Inhalation**

1500 w. Am Soc Ht & Vt Engrs, JI—July, 1918. Employers patriotic duty. Crippled Workers

The Reconstruction of the Crippled Soldier (89162). Douglas C. McMurtrie. Ills. 1000 w. Can Fndman—Sept., 1918. The patriotic duty of employers to study how crippled soldiers may be employed.

Rehabilitating Cripples at Ford Plant (89144 A). J. E. Mead. Ills. 2000 w. Iron Age—Sept. 26, 1918. Full efficiency attained by 85 per cent.

The Cripple's Ability as a Metal Worker (87933 A). Douglas C. McMurtrie. Ills. 2000 w. Iron Age—Aug. 1, 1918. Analysis of operations for one-armed or one-legged workers.

Cripples

Employment for Disabled Men (82670). 3000 w. Times Engng Supp—Oct. 26, 1917. Possibility of employing men disabled in war in the engineering trades.

Danger Signs

New Ideas in Danger Signs (82215). W. L. Chandler. Ills. 2500 w. Cl Age—Nov. 3, 1917. Criticism of the usual danger signs, with suggestions.

Drinking Fountains

Safe and Unsafe Drinking Fountains (84262 A). Ills. 1500 w. Sfty Eng—Jan., 1918. Types of bubblers are critically discussed.

Dust

The Effects of Dust Inhalation (88504 N). J. S. Haldane. 4500 w. Chem, Met & Min Soc S Af, JI—July, 1918. Results of investigations on the effects of inhaling different kinds of dust, and on conditions for neutralizing the ill effects.

Mortality from Respiratory Diseases in Dusty Trades (88870 N). Frederick L. Hoffman. 433 pp. U S Dept Labor, No. 231—June, 1918. Deals particularly with inorganic dusts.

The Effects of Dust Inhalation (88882 N). John Scott Haldane, with discussion. 30 pp. Instn Min Engrs, Trans—Aug.-Sept., 1918. Practical information based on investigations.

Dust in Industry (83887 A). Henry Field Smyth. 3000 w. Sci M—Jan., 1918. As a cause of occupational diseases.

Dust; Its Universality, Elimination and Conservation (83956 D). E. R. Knowles. Ills. 43 pp. Am Soc Ht & Vt Engrs, JI—Jan., 1918. Classification of dusts, their sources, elimination, recovery.

Dust Inhalation

The Effects of Dust Inhalation (87359 A). J. Scott Haldane. From paper before Instn. of Min. Engrs. 3500 w. Colly Gdn—June 14, 1918. Effect on the lungs; process of elimination, etc.

Dust-Inhalation In Mines (87728).

Efficiency

2700 w. Times Engng Supp—June, 1918. Effect on health of miners of inhaling dust in coal mines.

Efficiency

The Effect of Long Working Hours on Industrial Efficiency (87651). 1600 w. Auto Ind—July 18, 1918. How output has been increased by a reduction of hours of labor.

Employees

Central-Station Employee Relations (86786). Frank A. Farnsworth, Jr. Ills. 2500 w. Elec Wld—June 8, 1918. Benefits due to foresight in welfare work.

Engine Stops

Engine Stop Systems (84273). Ills. 2000 w. Pwr Pt Eng—Feb. 15, 1918. Safety devices to protect engines for overspeeding.

Explosives

Safety in the Use of Explosives (88787). Arthur La Motte. 2500 w. Cl Age—Sept. 12, 1918. Development of measures and appliances for avoiding accidents. List of "don'ts."

Eye Protection

New Kinks in Eye Protection (82614 A). L. L. Park. 1500 w. Sfty Eng—Nov., 1917. Forms of protectors.

Eye Protection in the Machine Industry (85979 A). Ills. 2500 w. Machy—May, 1918. Causes of injuries to the eye and methods of prevention.

Factory Restaurant

Factory Employees' Restaurant (84612 A). C. S. Rossy. 500 w. Ind Man—March, 1918. Plan and outline of a "help yourself" restaurant which has proved successful.

Fatigue

Hours of Labor and Fatigue Elimination (87566 A). John Holloway and S. B. Scotland. 9 pp. Cas Eng Mthly—June, 1918. Observations based on experience.

Cause of Industrial Fatigue (85286 A). C. B. Lord. 1500 w. Ind Man—April, 1918. Fatigue and recuperation, and the effect of mental attitude.

The Textile Industry (82679). 2000 w. Times Engng Supp—Oct. 26, 1917. Industrial fatigue, particularly in the textile industries in England.

Feeding Employees

A Dietary for Miners (85474). S. H. Brockunier. 3000 w. Eng & Min JI—April 6, 1918. Food rations and methods of food storage and preparation.

Fire Doors

Stopping Fires by Fire Doors (86858 A). C. E. Worthington. Ills. 2200 w. Sfty Eng—May, 1918. Reviews the history of their use.

WELFARE AND SAFETY**Furnace Screens**

Some Economic Aspects of Fire Protection Problems and Hazards in War Time (86683 A). J. Donald Pryor and Frank V. Sackett. (Abstract.) Ills. 8500 w. A S M E JI—June, 1918. Outlines the broader principles of fire-protection in essential industries.

Fire Protection

"Safety First" in a Large Factory (87972 A). Ills. 2500 w. Eng Rev—May, 1918. The fire-fighting system and the fire organization of the Schenectady works of the General Electric Co.

Fire Protection in Manufacturing Plants (89286 A). Charles E. Rigby. Ills. 5000 w. A S M E JI—Oct., 1918. (Abstract.) Considers the construction and occupancy of buildings, the protection by automatic sprinklers and results.

Fire Protection of Piers (86691 A). Frank V. Sackett. Ills. 5500 w. Int Mar Eng—June, 1918. Effectual methods of overcoming fire hazards on steamship piers.

La Prevenzione Incendi Negli Stabilimenti Industriali (87103 B). A. Ratti. 5500 w. Monitore Tecnico—Feb. 30, 1918. Serial, 1st parts. Methods of avoiding fire risks to persons and property in the city of Milan.

Fire Protection in Industrial Plants (82442 F). C. W. Johnson. 3000 w. A I Mt, JI—Sept., 1917. Elimination of causes; protection against spreading; and extinguishing, outlining principles.

Factory Fire Protection (83227 B). J. C. Gillette, with discussion. 20 pp. Cleve Eng Soc, JI—Nov., 1917. Instructions and rules for prevention of fires.

First Aid

First Aid in the Industries (89217 A). Dr. R. L. Cameron. 1800 w. Sfty Eng—Oct., 1918. Considers proper care of injuries and also the humanitarian side of the work.

Flying Objects

Injury from Flying Objects (89244 A). Chesla C. Sherlock. 3000 w. Am Mach—Oct. 3, 1918. Legal aspects discussed.

Flywheels

Disastrous Flywheel Explosion at Chicago (89302). Ills. 1200 w. Power—Oct. 8, 1918. Account of the explosion on Sept. 19, in engine room of Chicago Coated Board Co.

Furnace Screens

Protective Screens for Furnaces (85159). J. V. Hunter. Ills. 2500 w. Am Mach—Feb. 28, 1918. Types of shields used to protect workmen.

WELFARE AND SAFETY

Linemen

Goggles

Goggles More Than Protective (88677 A). W. T. Power. 1800 w. Ry & Loc Eng—Sept., 1918. The value to industrial workers when properly fitted.

Grinding Wheels

Bursting Grinding Wheels (89646 A). Chesla C. Sherlock. 2500 w. Am Mach—Oct. 24, 1918. Examples of numerous cases and court decisions as to employer's and owner's liability.

Health Supervision

Development of the Health Department of Thomas A. Edison Interests (86569 A). Mark M. Jones. 3000 w. Ind Man—June, 1918. How the department was developed and the results.

A Ministry of Health (86454 A). W. M. Bayliss. 1700 w. Nature—Apr. 18, 1918. Proposal to create a ministry of Health for England. Outline of its functions and scope.

Hospital Protection

How Army Hospitals Are Being Protected Against Fire (86624). Ills. 1700 w. Eng News-Rec—May 30, 1918. Steps to improve fire resistance of wood-frame buildings.

Hospitals

See same heading under Management.

Housing

See same heading under Management.

Workpeoples Welfare at a French Explosives Factory (84025 A). Ills. 1000 w. Engr—Jan. 11, 1918. From *Bul. des Usines de Guerre*. Housing accommodation at Sevrati-Livry.

See also same heading under CIVIL ENGINEERING, Construction.

Feeding and Housing Railway Maintenance of Way and Construction Employees (85704). 4500 w. Eng & Con—April 17, 1918. Study of methods of various railways, made by sub-committee of Am. Ry. Eng. Assn.

Welfare and the Housing Problem (85819 B). W. G. Cass. 2500 w. Cas Eng Mthly—April, 1918. Considers housing conditions of the working classes.

See also same heading under CIVIL ENGINEERING, Construction.

Industrial Hazards

Hazards in Connection With the Reaming and Riveting of Steel Cars (89214 A). Harry Guilbert. Ills. 1000 w. Sfty Eng—Oct., 1918. Calls attention to common hazards and the way to avoid them.

Industrial Health

Illness in Industry—Its Cost and Prevention (85799 D). 3000 w. A I M E, Bul—April, 1918. Discussion of Dr. Thomas Darlington's paper.

Industrial Diseases

Siliceous Dust in Relation to Pulmonary Disease Among Miners in the Joplin District, Missouri (86931 A). Edwin Higgins, A. J. Lanza, F. B. Laney, and George R. Rice. Ills. 108 pp. U S Bur Mines—Bul. 132. Investigations, etc.

Industrial Health

Illness in Industry—Its Cost and Prevention (84346 D). Thomas Darlington. 15 pp. A I M E, Bul—Feb., 1918. How physiology may be applied to working conditions. Importance of health to industry.

Illness in Industry: Its Cost and Prevention (84556 A). Thomas Darlington. 5500 w. Sfty Eng—Feb., 1918. Calls attention to causes of illness and what may be done to improve conditions.

Cost of Industrial Health Supervision (83298 A). Reginald Trautschold. 5000 w. Ind Man—Jan., 1918. Statistics giving actual cost figures of health supervision.

Industrial Hospitals and Dispensaries (89216 A). Dr. T. R. Crowder. 1200 w. Sfty Eng—Oct., 1918. As a means of conserving the health of industrial workers.

Industrial Housing

See same heading under CIVIL ENGINEERING, Construction.

Industrial Rules

Violation of Industrial Rules (84563 A). Chesla C. Sherlock. 1800 w. Ind Man—March, 1918. Law in regard to compensation for accidents.

Industrial Safety

Five Men in the Shops Behind Every Man in the Trenches (84555 A). David M. Allan. 3000 w. Sfty Eng—Feb., 1918. Calls attention to injuries due to carelessness and how to avoid them.

Insurance

Our Group Insurance Plan (83308 A). A. J. Schneider. 1200 w. Ind Man—Jan., 1918. Describes plan of the Cincinnati Planer Co.

Labor

Human Problem Thought of Paramount Importance in Paris Shrapnel Plant (85913). Robert K. Tomlin, Jr. 2000 w. Eng News-Rec—April 25, 1918. Health of 6,000 women employees safeguarded.

Law

Abnormal Movement of Machinery (89039 A). Chesla C. Sherlock. 4000 w. Am Mach—Sept. 26, 1918. Résumé of laws in regard to injuries caused by the accidental starting of machinery.

Linemen

Safety for Electric Linemen (82389). Ills. 10 pp. Trav Stand—Nov., 1917. Calls attention to prime requisites for safety.

WELFARE AND SAFETY

Quarry Accidents

Low Voltages

Industrial Hazards of Low Voltages (82805). Charles A. Laufer. 3000 w. Elec J1—Dec., 1917. Hazards from circuits of 600 volts and less.

Low Voltage

Low Voltage Hazards (82615 A). C. A. Laufer. 7000 w. Sfty Eng—Nov., 1917. Applies to circuits of 600 volts and under. Dangers, precautions, treatment of injuries, etc.

Lubricants

The Hazardous Use of Oil in Contact With Oxygen Under Pressure (85233 A). B. C. Condit. 1500 w. Weld Eng—March, 1918. Liable to produce an explosive mixture.

Malaria Control

Southern Railroads and the Problem of Malaria Control (88296). R. C. Derivaux. 2000 w. Ry Rev—Aug. 17, 1918. Importance of drainage and use of screens on bunk cars and houses.

Maritime Work

Accident Hazards in Maritime Work (82121 A). F. L. Hoffman. 1800 w. Mar Rev—Nov., 1917. Analysis of the accident record of the American merchant marine.

Mechanical Arms

Mechanical Arms for Maimed Soldiers (82290 A). Ills. 2200 w. Engr—Oct. 19, 1917. Serial, 1st part. The problem and the difficulties and requirements.

Metallurgical Plants

Safety and Health in Hydrometallurgical Plants (88798 A). A. W. Allen. 1800 w. Eng & Min J1—Sept. 14, 1918. Emphasizes the importance of exercising care in design and of considering the operator of the plant.

Mine Accidents

Who Gets Hurt and When? (88785). 1200 w. Cl Age—Sept. 12, 1918. Details in regard to the distribution of mine accidents. Points of greatest accident hazard indicated.

Recording Accidents in Mines (89616 A). Albert H. Fay. 1800 w. Eng & Min J1—Oct. 19, 1918. Need for accurate statistical reports. Examples of tabular summaries given.

Mine Accidents Classified by Mining Methods for the Lake Superior District, 1915 (84420 N). Albert H. Fay. 1800 w. L S Min Inst, Pro—1917. Accident data classified by causes and mining methods.

Mine Labor and Accidents (84345 D). Herbert M. Wilson. 1000 w. A I M E, Bul—Feb., 1918. Relation of personnel work to accident prevention.

Mine Labor and Accidents (85798 D). 3000 w. A I M E, Bul—April, 1918. Discussion of Herbert M. Wilson's paper.

Mine Cafeteria

See same heading under MINING AND METALLURGY, *Mine Operation*.

Mine Safety

Mine Safety in Wartime (89258). D. Harrington. 3500 w. Cl Age—Oct. 3, 1918. Reviews the present conditions and gives suggestions.

Munition Workers

Health of Munition Workers (88410). 3400 w. Times Engng Supp—July, 1918. Report of British Committee.

The Health of Munition Workers (87899 A). 3500 w. Engng—July 5, 1918. Editorial review of the committee report concerning conditions.

National Welfare

The Application of Organized Knowledge to National Welfare (85998 A). P. G. Nutting. 4500 w. Sci M—May, 1918. Outline of some of the more general problems involved.

Oil Infection

Infection from Cutting Oils (88164 N). Ills. 9 pp. Trav Stand—July, 1918. Dangers from unsanitary conditions.

Occupations

Protected Occupations (84469 A). 3500 w. Ir & Cl Trds Rev—Feb. 1, 1918. Main features of a revised schedule which went into effect in England Feb. 1, 1918.

Oil Fires

The "Foamite" System for Extinguishing Oil Fires (83240 A). Ills. 2000 w. Sfty Eng—Dec., 1917. This method explained in detail.

Organization

Fisk Rubber Company's Organization for Safety (84554 A). H. L. Martin. 1700 w. Sfty Eng—Feb., 1918. Details of organization and its work.

Public Health

Public Health and Engineers (89068). 2000 w. Times Engng Supp—Aug., 1918. Need of team work for accomplishing results.

Physical Training

How Physical Training Helps Factory Executives (87092 A). D. C. Stanbrough. 1200 w. Ind Man—July, 1918. Experience of the Packard Motor Co.

Poisonous Gas

Poisonous Gas in Warfare—Application, Prevention, Defense, and Medical Treatment (82533 B). 25 pp. Prof-Mem—Nov.-Dec., 1917. A short, annotated bibliography of gases and kindred devices applied in the present war. Prepared by Henry E. Haferkorn, assisted by Felix Neumann.

Quarry Accidents

Accident Prevention in Quarry Operation (87621). William H. Baker. 2500

Railroad Sanitation**WELFARE AND SAFETY****Safety Rules**

w. Eng & Con—July 17, 1918. From an address before the National Safety Council. Work of the Committee on Safety and Welfare at the Hannibal mills of the Portland Cement Co.

Railroad Sanitation

The Sanitarian's Work is Valuable to a Railroad (84972). A. E. Campbell. Ills. 3000 w. Ry Age—March 15, 1918. Outline of work to remove unhealthful conditions on the Illinois Central.

Rescue Apparatus

Oxygen Mine Rescue Apparatus (82937). F. W. Gray. 3300 w. Can Min JI—Dec. 1, 1917. Information from bulletin of U S Bureau of Mines prepared by Dr. Yandell Henderson and James W. Paul. Deals with characteristics of existing types, their limitations, and possible improvement.

Rescue Work

Mine Rescue Work (87841 B). H. D. Trounce. Ills. 16 pp. Prof Mem—July-Aug., 1918. Deals particularly with military mining, use of reviving apparatus for rescue of gassed men, etc.

Mines Rescue Work (85230 N). Robert Watt. 2500 w. Qnsd Gov Min JI—Feb., 1918. Paper read to trainers at Silkstone, Queensland. Details of apparatus used and outline of work.

Respirators

Les Appareils Respiratoires Clos (85146 B). 2400 w. La Nature—March 2, 1918. The new Gibbs apparatus as designed for mine rescue work, fireman and others.

Rest Rooms

Rest Rooms and Their Influence on Application to Work (87164 A). L. H. Butler. Ills. 700 w. Ind Man—July, 1918. Benefits when properly managed.

R. R. Y. M. C. A.

Remarkable Progress Being Made by R. R. Y. M. C. A. (85450). John F. Moore. Ills. 4000 w. Ry Age—April 5, 1918. Service in war work.

Safeguards

Mechanical Safeguards (82516 A). David S. Beyer. Ills. 4000 w. Safety Eng—Oct., 1917. Their value and importance.

Built-In Guards for Machinery (89563 A). John R. Brownell. Ills. 1200 w. Met Trds—Oct., 1918. Importance of having safety devices made an integral part of the machinery.

Mechanical Safeguards (89215 A). David S. Beyer. 4500 w. Sfty Eng—Oct., 1918. Progress in the development of mechanical guards, their value and importance.

Safety

New York Central Safety-First De-

partment (87225). 3000 w. Ry Age—June 28, 1918. Sketch of its operation.

Industrial "Safety First" (87544 A). 2200 w. Eng Rev—June, 1918. The meaning and method of development in Great Britain.

See same heading under MARINE AND NAVAL ENGINEERING.

Safety Appliances

Mine Safety Appliances in Warfare (88789). F. H. Trego. 1800 w. CI Age—Sept. 12, 1918. Importance of conserving human life. Use of Gibbs self-contained breathing apparatus.

Safety Code

Scope and Application of the National Electrical Safety Code (87158 A). 80 pp. U S Bur Stds, Circ. 72—June 17, 1918. Explains the need of the code and gives examples of electrical injuries which might be avoided by its application.

Safety Devices

Mine Safety Devices Developed by the United States Bureau of Mines (86817 N). Van H. Manning. 7 plates. 5000 w. Gov Print Office—Pub. 2473. Outlines the character and method of use of the more important devices.

Safety Engineers

Duties of the Safety Engineer (89220 A). David Van Schaack. 2500 w. Sfty Eng—Oct., 1918. Safe-guarding and education; getting results; personal qualifications.

The Safety Engineer (87308 A). L. A. de Blois. 2500 w. A S M E, JI—July, 1918. The important relation of safety engineering to other branches of engineering.

Duties of the Safety Engineer (82158 A). David Van Schaack. 4000 w. Sfty Eng—Oct., 1917. Outlines the work and opportunities in accident prevention.

Safety Methods

Old and New Safety Methods (82750). F. S. Riordan. Ills. 1800 w. CI Age—Dec., 1, 1917. Changes that have taken place and the results.

Safety Methods in the Electrical Industry (82755). H. J. Burton. 2000 w. Elec Wld—Dec. 1, 1917. Rules, practices, and precautions that should be observed.

Safety Orders

General Construction Safety Orders of the California Industrial Accident Commission (82354). 5500 w. West Eng—Nov., 1917. Orders prepared by committees of different interests involved.

Safety Rules

Calumet of Arizona Safety Rules (84364). 3300 w. Min of Sci Pr—Feb. 16, 1918. Practical rules in force.

MISCELLANY

Belgium

Safety Work

Safety Council Discusses Conservation of Man Power (89168). 3500 w. Ry Age—Sept. 27, 1918. Unification of safety work under federal control.

A Year's Progress in Electrical Safety Work (83518). Morton G. Lloyd. 2500 w. Elec. Rev, Chi—Jan. 5, 1918. Results of first year's trial of the Natl. Elec. Safety Code.

The Electrical Safety Work of the Bureau of Standards (84557 A). Morton G. Lloyd. 2500 w. Sfty Eng—Feb., 1918. Study of accident statistics and hazards.

The Importance of Organized Safety Work (86171). H. W. Belnap. 3000 w. Ry Age—May 10, 1918. Plea for general application of methods of reaching the employee in accident prevention campaigns.

Sanitation

The Engineers' Interest in Sanitary Legislation (87575 A). E. J. McCaustland. 13 pp. E Cb St L. J1—May-June, 1918. Their influence in promoting public health and securing more effective sanitary legislation.

Plant Sanitary Equipment (86267 A). W. N. Fitch. 2500 w. Sfty Eng—April, 1918. Sanitary requirements.

Santa Fe Ry.

Development of Santa Fe Reading Room System (87804). Charles E. Parks. Ills. 2500 w. Ry Age—July 26, 1918. Reasons for its establishment, and the good results.

Shop Sanitation

Washing Facilities for Industrial Plants (84260 A). A. C. Carruthers. Ills. 1800 w. Sfty Eng—Jan., 1918. The importance of washing facilities, with examples.

Slipping

The Menace of Slipping (86266 A). Ills. 1200 w. Sfty Eng—April, 1918. Casualties due to slipping, etc.

Steel Cars

Hazards in Connection with the Reaming and Riveting of Steel Cars (82155 A). Harry Guilbert. Ills. 2500 w. Sfty Eng—Oct., 1917. Some of the common hazards and ways of avoiding them.

Safety

Strains and Overexertion (86405). Chesla C. Sherlock. 2200 w. Am Mach

—May 23, 1918. Résumé of court decisions in regard to injuries caused by strains.

Stonecutters

Effect of the Air Hammer on the Hands of Stonecutters (89610 N). Ills. 142 pp. U S Dept Labor, No 236—July, 1918. Reports of studies as to the detrimental effects upon the health.

Switches

Safety Enclosed Switches (84261 A). Walter Greenwood. 3000 w. Sfty Eng—Jan., 1918. Principles of a safety switch.

Textile Industries

Accident Prevention in Textile Industries (85276 A). David Van Schaack. 5000 w. Sfty Eng—March, 1918. Address at Boston. Features of Safety work. Devices used, etc.

Tools

Dangerous Tools and Appliances (89588 A). Chesla C. Sherlock. 2500 w. Am Mach—Oct. 17, 1918. Explains some of the liabilities of employers for accidents due to defective tools.

TNT Poisoning

Prevention and Treatment of Poisoning by Trinitrotoluol and Picric Acid (83242 A). R. W. Chaffee. 1200 w. Sfty Eng—Dec., 1917. Precautions, etc.

Welding

"Safety First" in the Oxy-Acetylene Industry (84259 A). B. Kopferschmith. 2000 w. Sfty Eng—Jan., 1918. Calls attention to unsafe practices in welding.

Welfare Work

Reo's Clubhouse for Workers (86892). C. J. Shower. Ills. 1500 w. Auto Ind—June 13, 1918. Welfare work of the Reo Motor Car Co., Lansing, Mich.

Wood Alcohol

Dangers in the Manufacture and Industrial Uses of Wood Alcohol (84890 N). Ills. 15pp. N Y Dept Labor, Bul 86—Dec., 1917. Investigates conditions of manufacture, and use in the industries, proposing rules to eliminate dangers.

Workmen's Compensation

Workman's Compensation Act (83474). Samuel R. Artman. 2500 w. Telephony—Jan. 5, 1918. Read at Indiana Ind. Tel. Convention. Experiences in administration.

MISCELLANY

Agriculture

The Agricultural Problem (83328 A). Liberty H. Bailey. (Abstract.) 3000 w. A S M E, J1—Jan., 1918. Food production problems and their relation to the war.

Belgium

A Possible Contribution to Belgium (87790 A). Editorial. 600 w. Ind Man—Aug., 1918. A suggestion for the future industrial reconstruction of Belgium.

MISCELLANY

Japan

Chemical Industry

The Future of Chemical Industry in the United States (82187 B). L. H. Backeland. 4000 w. JI Ind and Eng Chem—Nov., 1917. Its future permanence, its needs and problems.

China

British Engineering Enterprises in China (89150 A). 3000 w. Engng—Aug. 30, 1918. Considers the adverse influences that have crippled British engineering enterprises.

Commerce

Commerce as a National Service (89555 A). 2200 w. Aust Min Std—Sept. 5, 1918. Digest of lecture by W. L. Raws, in Melbourne.

Distribution

The Overseas Distribution of Engineering Appliances (86726 A). Leonard Andrews. Abstract of paper read before the Instn. of Elec. Engrs. 4500 w. Ir & CI Trds Rev—April 19, 1918. How to obtain maximum efficiency in overseas trade and the costs to producers and the community.

Economic Conditions

The Present Economic and Social Conditions as Results of Applied Science and Invention (84882 A). George W. Perkins. 2500 w. Sci M—March, 1918. Outlines past and future progress due to science and invention, and the need of educating the public.

Enemy Property

Enemy Property (87789 A). Editorial. 600 w. Ind Man—Aug., 1918. What enemy property includes and how it must be managed.

Engineering Discussion

Under New Management—The Fallacy of Engineering Discussion (83288 A). Charles M. Horton. 3500 w. Ind Man—Jan., 1918. Interesting essay.

Engineering Industries

The Health of the Engineering Industries (88386 A). 3500 w. Eng Rev—July, 1918. The recently issued report of the Board of Trade Committee appointed to consider the position of the engineering trades after the war is summarized and discussed.

Engineers

The Engineer After the War (86902 A). Bruce C. Yates. 4500 w. Pahasapa Qr—June, 1918. Address to the Dakota School of Mines.

Engineering Prestige (85808). R. O. Wynne-Roberts. 9000 w. Can Engr—April 18, 1918. Survey of what can be done to improve the welfare and national status of engineers.

The Engineer in the New Democracy (85814 B). George C. Whipple. 20 pp. Bos Soc C E, JI—April, 1918. The place

of engineers in the war and what will come after. Address of retiring president.

Awakening Recognition of the Engineer (82616). Fraser S. Keith. 3800 w. Can Engr—Nov. 22, 1917. Address before Ottawa Branch of the Can. Soc. of Civ. Engrs. Plea for greater recognition.

The Engineer of To-day (82686 B). Henry J. Burt. 4000 w. Iowa Eng Soc Pro—Feb., 1917. Analyzes the present situation.

Under New Management—The Engineering Mind (82643 A). Charles M. Horton. 2500 w. Ind Man—Dec., 1917. Plea for broader education and experience.

German Industries

A Travers Les Revues Techniques Allemandes (83904 B). 2000 w. La Nature—Nov. 24, 1917. Extraction of greases, production of high-speed steel; copper, leather, rubber, and other industries as gathered from German technical papers.

Germany

What Is Germany Preparing to Do After the War? (89246 A). 4000 w. Am Mach—Oct. 3, 1918. Outline Germany's postwar plans as prepared by the Guarantee Trust Co., New York.

Inventions

British, French and Americans as Leaders in Engineering and Inventing (87916). 1800 w. Eng & Con—July 31, 1918. Claims that Germany has to its credit fewer inventions than any one of the three nations.

Discovery and Invention (83091 A). Dugald Clerk, with discussion. Truman Wood lecture. 11000 w. Roy Soc Arts, JI—Dec. 7, 1917.

Never made in Germany (82731). Townes R. Leigh. 2000 w. Mfrs' Rec—Nov. 29, 1917. Proving that the great inventions that advanced civilization were not of German origin.

Science and Its Functions (83022 A). Alan A. Campbell Swinton. Chairman's address. 10000 w. Roy Soc Arts, JI—Nov. 23, 1917. Early scientific methods and inventions, their development and history, aims and functions.

The United States Towers Supreme in Practical Inventions Among the Nations of the Earth (83120). Townes R. Leigh. 2200 w. Mfrs' Rec—Dec. 20, 1917. The role America has played in inventions.

Japan

Industrial Japan (87397 A). 3500 w. Engng—June 14, 1918. The importance of its coal, iron, steel, and shipbuilding industries.

MISCELLANY

War Effects

Milwaukee

Shops Proclaim City's Resources (89279). Ills. 3000 w. Ir Trd Rev—Oct. 3, 1918. Reviews the metal working and machinery industries.

True Spirit of War Permeates Industries of Milwaukee (89276). G. H. Manlove. Ills. 2500 w. Ir Trd Rev—Oct. 3, 1918. Industrial power consecrated to the country.

Post-War

Post-War Problems (89511 A). G. S. Beeby. 1500 w. Aust Min Std—Aug. 29, 1918. Serial, 1st part. Problems affecting capital and labor, especially conditions in Australia.

Ramsay

Sir William Ramsay (87679 B). Richard B. Moore. Ills. 27 pp. Fkn Inst, Jl—July, 1918. Biographical sketch, reviewing his work. Also bibliography of his work.

Reconstruction

British Reconstruction Plans (85540). Robert P. Skinner. 4000 w. Am Mach—April 4, 1918. Tells of plans being made by British to meet after-war conditions.

Russia

Conditions in Russia (87858). Fedor F. Foss, with editorial. Ills. 4500 w. Min & Sci Pr—July 27, 1918. Address before the Engrs' Club of San Francisco. Explains conditions and discusses how to assist in reconstruction.

The Industrial Disintegration of Russia (83989 A). Sterling H. Bunnell. 2500 w. Iron Age—Jan. 31, 1918. Recent observations and opinions.

Russia—An Opportunity for American Engineers (83260 B). George C. Whipple. 28 pp. Bos Soc Civ Engrs, Jl—Dec., 1917. Facts gathered during a recent journey through Russia.

Salesmanship

Engineering Salesmanship (88493 A). Charles W. Hunt. Abstract of a paper before Manchester Assn. Engrs. 1700 w. Machy—Sept., 1918. First principles, etc.

Securing Employment

How I Landed My Job (85290 A). L. A. Terven. 1500 w. Ind Man—April, 1918. Value of personal interviews, introduction of friends, etc.

South Africa

Industrial Development in South Africa (86128 N). J. H. Dobson. 16 pp. So Af Instn Elec Engrs, Trans—Feb., 1918. The industrial awakening.

Textile Industry

The Textile Industry in Relation to the War (87306 A). J. E. Rousmaniere. 2000 w. A S M E, Jl—July, 1918. The needs of the Government, and the re-

sponse of the industry to the demands upon it.

Trade

Post-War Trade Policy (86705 A). 4000 w. Colly Gdn—May 3, 1918. Information from the reports of the English committee on commercial and industrial policy after the war.

U. S. Industries

The Part the United States Industries Must Perform to Enable the Allies to Win the War (89457 N). C. G. Schluenderberg. 9 pp. Am El Chem Soc—Oct., 1918. Reviews particularly the electrochemical industries and their application to war work.

War

An Optical War (87533). Ransom Pratt. Address before the Rotary Club, San Francisco. 1600 w. West Eng—July, 1918. Part played in war by field-glasses, range-finders, periscopes, cameras, microscopes and other optical instruments.

Today's After War Responsibilities (88464 A). 800 w. Ind Man—Sept., 1918. Editorial on the responsibility of today.

The Business of War (83490). Charles T. Hutchinson. 2500 w. Min & Sci Pr—Jan. 5, 1918. Reviews conditions and the attitude of the industries and of labor.

The Great War and the Work Ahead (83310 A). 2500 w. Ind Man—Jan., 1918. Editorial on the future outlook for United States.

War Aims

What We're Fighting For (83657). Frederick Landis, with introductory address. 22 pp. St L Ry Cb, Pro—Dec., 1917.

What Are We Fighting For? (83039). William H. Taft. 6500 w. Power—Dec. 18, 1917. Address to the A S M E, New York City, Dec. 4, 1917, on "The Nation's Call to the Professional Man."

War Effects

Manchester Local Section: Chairman's Address (83613 N). C. J. Beaver. 8000 w. Instn E E, Jl—Dec., 1917. Effects of war on world's industry and industrial progress. Necessities revealed.

Birmingham Local Section: Chairman's Address (83615 N). Sydney T. Allen. 4000 w. Instn E E, Jl—Dec., 1917. Effects of the war and needed developments of electrical industries.

Western Local Section Chairman's Address (83612 N). R. Howard Fletcher. 2500 w. Instn E E, Jl—Dec., 1917. Problems arising from war necessities.

MISCELLANY

Wool Industry

War Industries

The Work of the Machine-Tool Section of the War Industries Board (85167). 2500 w. Am Mach—March 7, 1918. Report of principal activities.

War Needs

What We Must Do to Win the War (86758 A). E. W. Rice, Jr. Delivered before Pittsfield Section of A. I. E. E. 3500 w. Gen Elec Rev—June, 1918. Explains the need of every man, woman and child doing their utmost to assist war efforts.

War Obligations

Some Things We Can Do to Help Win the War (86255). Eugene H. Angert. 16 pp. St L Ry Cb, Pro—April 12, 1918. Patriotic address.

War Protection

War Protection for Industrial Plants (84562 A). Thomas W. Gregory. 1200 w. Ind Man—March, 1918. Duties of employers in protecting American factories against sabotage and disloyalty.

Wars

Blocking New Wars (87021). Herbert S. Houston. 2000 w. Pwr Pt Eng—June 15, 1918. The force to do it. A league of nations.

Wool Industry

The Australian Wool Industry (86823 A). Ills. 1800 w. Aust Min Std—May 9, 1918. Serial, 1st part. Its possibilities and difficulties. What Australia is doing with the wool clip.

MARINE AND NAVAL ENGINEERING

Cargo Carrier

Address

Presidential Address of Mr. Alexander Cleghorn (82932 N). 40 pp. Instn E & S Scot, Trans—Nov., 1917. Deals mainly with recent progress in marine engineering and steps taken to establish an Association in Scotland for scientific and industrial research.

Balancing

Dynamic Balancing (85040 F). F. J. Cleary. Ills. and Plates. 35 pp. Am Soc Nav Engrs, J1—Feb., 1918. Detailed description of method developed and used at Mare Island for dynamically balancing the rotating elements of the turbine propelling machinery U. S. S. "Shaw."

Notes on the Subject of Balancing (86928 F). N. W. Akimoff. 11 pp. Am Soc Nav Engrs, J1—May, 1918. Reply to Commander Cleary's article on "Dynamic Balancing."

Barge Canal

See same heading under CIVIL ENGINEERING, *Waterways and Harbors*.

Battleships

Emergency Repairs to a Battleship (84230 A). E. E. Wilson. Ills. 2500 w. U S Nav Inst, Pro—Jan., 1918. Details of work on the "Arkansas" in substituting an electric motor for the wrecked starboard main circulating pump.

The Italian Battle Fleet (85706 A). Ills. 2500 w. Engr—March 22, 1918. Explains the difficulties to be met in the Adriatic, and the inadequacy of the Italian Navy to meet conditions. Describes types of battleships.

Boat Incline

Cable Inclines Carry Boats Over Illinois River Levee (84391). Ills. 1200 w. Eng News-Rec—Feb. 21, 1918. Electrically operated marine railway eliminates necessity for lock connection.

Bolts

Stress Distribution in Bolts and Nuts (86583 N). C. E. Stromeyer. Ills. 5000 w. Instn Nav Archts—Mar. 21, 1918. Elementary principles discussed, giving results of investigations.

Barges

Upper Mississippi River Barge Fleet (88876 A). Baxter L. Brown. 1200 w. E Cb St L, J1—July-Aug., 1918. Details of barges and towboats for freight transportation between St. Louis and St. Paul.

Blowers

Installation and Care of Sturtevant VD-5 Turbo-Blower (88972 N). F. W. Sterling. Ills. 1200 w. Am Soc Nav Engrs, J1—Aug., 1918. Details of alignment, operation, packing, bearings, etc.

Test of Sturtevant Forced Draft Blower (88971 N). M. C. Stuart. Ills. 26 pp. Am Soc Nav Engrs, J1—Aug., 1918. A test of performance.

Boiler Corrosion

Marine Boiler Corrosion; Causes and Prevention (88831). D. E. Rees, with discussion. 6000 w. Mar Eng, Can—Aug., 1918. Treatment, lubrication effects, effect of air, etc.

British Columbia

British Columbia's Ships (85139). 1700 w. Naut Gaz—Feb. 28, 1918. Detailed specifications for wooden ships now building in British Columbia Yards.

British Navy

Our Merchant Navy—The War and After (87401 A). 5000 w. Engr—June 14, 1918. The importance of the mercantile marine as a part of the British navy; shipping and shipbuilding before the war; the present and future.

Bulkhead Doors

Watertight Doors (84095 A). I. Toro. Ills. 1800 w. Int Mar Eng—Feb., 1918. A system of doors giving communication without impairing water-tightness.

Capacity

Passengers In Ships (87725). 1000 w. Times Engng Supp—June, 1918. Cost of passenger transportation as compared with cargo.

Cargo Carriers

Proposed Barge for New Waterway (83995 B). Henry J. Gillow. 3000 w. Mar Rev—Feb., 1918. Type and size of cargo carrier advocated for use on N. Y. state barge canal.

Consult Classification of the Index. See page 9.

Cargo Ships

New Type of Cargo Carrier Wins Favor on Pacific (85929 N). R. C. Hill. 1600 w. Mar Rev—May, 1918. Details of a steel cargo vessel designed and built on the Pacific Coast.

Design and Construction of Self-Propelled Reinforced Concrete Sea-Going Cargo Steamers Now Building in Great Britain (88053 A). T. G. Owens Thurston. Ills. 4500 w. Int Mar Eng—Aug., 1918. Read before Instn. Nav. Archts., London.

Cargo Steamers (85885). 2600 w. Times Engng Supp—Mar. 29, 1918. Discussion of standard designs before Inst'n Naval Architects.

Reinforced-Concrete Sea-Going Cargo Steamers (85690 A). T. G. Owens Thurston. Read before Instn. of Nav. Archts. Ills. & Plates. 4500 w. Engng—March 29, 1918. Design and construction of self-propelled vessels now building in Great Britain.

Standard Cargo Ships (85523 A). George Carter. Read before Instn. Nav. Archts. Ills. 4500 w. Engng—March 22, 1918. The advantages as a war measure, and some account of the design and construction.

The Most Suitable Sizes and Speeds for General Cargo Steamers (85524 A). John Anderson. Ills. 3300 w. Engng—March 22, 1918. Read before Instn. Nav. Archts. Method of arriving at the most economical dimensions for any length of voyage, condition of loading, or speed.

Standard Cargo Ships (86579 N). George Carter. Ills. 5000 w. Instn Nav Archts—Mar. 20, 1918. Advantages of standardization in the construction of large cargo vessels as a war measure.

The Most Suitable Sizes and Speeds for General Cargo Steamers (86580 N). John Anderson. Ills. 4000 w. Instn Nav Archts—Mar. 20, 1918. Aims to formulate a method by which the most economical dimensions can be arrived at, for any length of voyage, condition of loading, or speed.

On the Design and Construction of Self-Propelled Reinforced Concrete Sea-Going Cargo Steamers Now Building in Great Britain (86585 N). T. G. Owens Thurston. Ills. 12 pp. Instn Nav Archts—Mar. 23, 1918. Details.

Car Transports

Seagoing Car Transports (85137). Ills. 2200 w. Naut Gaz—Feb. 28, 1918. Designs for fast seagoing car transports for use on the coast or Great Lakes.

Concrete Boats**Cargo Vessels**

The Most Suitable Sizes and Speeds for General Cargo Steamers (88702 A). John Anderson. Read before Instn. Nav. Archts., London. 2500 w. Int Mar Eng—Sept., 1918. Method of determining most economical dimensions.

Classification

American Classification for American Ships (85591 A). Winthrop L. Marvin. 3500 w. Int Mar Eng—April, 1918. Suggestions from the committee on merchant marine of the Boston Chamber of Commerce, with review of history of American navigation.

Coal Pier

New Reading Coal Pier Has Interesting Features (85152). Ills. 1500 w. Ry Age—March 22, 1918. Modern car unloading machine doubles capacity of Port Reading (N. J.) terminal.

Concrete Barge

1,000 Ton Reinforced Concrete Barge (89154 A). Ills. 500 w. Engng—Aug. 30, 1918. Vessel launched in the Lake Shipyard, England, is described.

Concrete Coal Barges (89255). J. F. Springer. Ills. 3000 w. Cl Age—Oct. 3, 1918. Survey of the concrete boat-building industry.

Concrete Barges Built True to Design Dimensions (89582 A). Ills. 2000 w. Eng News-Rec—Oct. 17, 1918. Special spacers fix wall thickness and rod location.

Standard Concrete Barge for Use on the New York State Barge Canal (89317 A). Ills. 600 w. Int Mar Eng—Oct., 1918. Authorized design. Plans and specifications.

Concrete Barges (88051 A). Louis L. Brown. Ills. 1000 w. Int Mar Eng—Aug., 1918. Design, method of construction, materials used, method of waterproofing and launching.

Concrete Barges Designed for New York State Canal (88086 A). Ills. 700 w. Eng News-Rec—Aug. 8, 1918. Plans for 500-ton tow-boats soon to be put in service.

Concrete Ships

Sulle Navi in Cemento Armato (83-304 B). Ills. 1200 w. L'Industria—Nov. 21, 1917. Design and construction of reinforced concrete vessel 98 ft. long.

Concrete Ship Policy Defended (88251). A. Piez. 3000 w. Naut Gaz—Aug. 17, 1918. Shipping Board heads explain why no more vessel contracts are let.

Problems of Designing the Reinforced-Concrete Ship (87808 A). From paper by Messrs. Wig and Hollister

Concrete Ships

before Am. Concrete Inst. Diagrams. 4000 w. Eng News-Rec—July 25, 1918. Problems met by the Emergency Fleet Corporation.

Concrete Ships of 3,500 Tons Dead-weight Designed by Emergency Fleet Corporation (88050 A). Ills. 1200 w. Int Mar Eng—Aug., 1918. Detailed description.

Construction of Concrete Ships for Emergency Fleet Corporation (88152). R. J. Wig. Abstract of report to Edward N. Hurley. Ills. 1000 w. West Eng—Aug., 1918. Describes the 3,500-ton type of vessel.

Les Remorqueurs En Béton Armé (88431 B). G. Espitallier. Ills. 2500 w. Génie Civil—July 27, 1918. Tow boats built of concrete at French yards. Design and details.

Lightning Hazard of Concrete Ships (88104). H. W. Spang. 1000 w. Naut Gaz—Aug. 10, 1918. Precautions necessary.

The Possibilities of the Ferro-Concrete Ship (85761 A). Maurice Deny. Ills. 7500 w. Engng—April 5, 1918. Read before the Instn. of Nav. Archts. A preliminary survey of the possibilities of this material for ships.

Will the Concrete Steamship Measure Up to Builders' Expectations? (85421). Albert Phenis. Ills. 1500 w. Mfrs' Rec—April 4, 1918. Discusses the advantages and disadvantages of concrete ships, and their reliability.

Concrete Ships (88870 A). Harvey S. Owen. 4500 w. E Cb St L, JI—July-Aug., 1918. As an aid in the solution of trans-Atlantic transportation problem.

How Concrete Ship Was Developed (88560 A). Frank C. Heard. 1500 w. Mar Rev—Sept., 1918. First construction used in rowboat in 1849.

The Design of Concrete Ships (89023 A). H. Devereux. Ills. 6500 w. West Eng—Sept., 1918. Serial, 1st part. General rules based on approved practice. Typical example given.

Developments in Concrete Barges and Ships (88705 A). J. E. Freeman. Read before Am. Concrete Inst. 2500 w. Int Mar Eng—Sept., 1918. Résumé of history of concrete shipbuilding in the United States and Europe.

Concrete Ships (89070). 2500 w. Times Engng Supp—Aug., 1918. Serial, 1st part. British experience, progress made, types of vessels, etc.

Method of Concrete Ship Construction (88704 A). Theodore Ahlborn. Ills. 1100 w. Int Mar Eng—Sept., 1918. Assumptions for producing a design that will take care of all stresses. Methods of construction.

Concrete Ships

Reinforced Concrete Vessels (88703 A). Walter Pollock. Ills. 3000 w. Int Mar Eng—Sept., 1918. Factors involved in designing small coast-wise concrete motor ships.

Construction of Concrete Ships (87463 N). 56 pp. Gov Print Off, Doc. 239—June 7, 1918. Letters and reports submitted on the cost, plant and advantages.

Construction Problems Many in Building Concrete Ships (87505). 2500 w. Eng News-Rec—July 11, 1918. How the Shipping Board is preparing for the new government construction as outlined by Rudolph J. Wig and S. C. Hollister, in paper before Am. Concrete Inst.

Government Attitude on the Concrete Ship (87318 A). Waldon Fawcett. 1200 w. Int Mar Eng—July, 1918. Open minded but waiting for results.

Government Designs and Builds 3500-Ton Concrete Ships (87313). Ills. 1500 w. Eng News-Rec—July 4, 1918. Details of vessels under construction.

The Big Concrete Ship Not Unreasonable (87319 A). J. F. Springer. 5000 w. Int Mar Eng—July, 1918. Views of an advocate of reinforced-concrete vessels.

Concrete Ships (87149). E. O. Williams. 2000 w. Times Engng Supp—May, 1918. Advantages and defects of such construction.

Navi In Cemento Armato (87100 C + D). F. Dondona. Ills. 8000 w. Rivista Marittima—Jan.-Feb., 1918. Design and construction of reinforced concrete vessels, particularly those built in France and in Scandinavian countries. Arrangement of ways, etc.

Construction of Reinforced Concrete Ships by Hennebique and Marelle Systems (86601). G. Espitallier, in *Le Génie Civil*. Ills. 1800 w. Eng & Con—May 29, 1918. Details of these two French systems.

Observation on Ferro-Concrete Ships (87060). Joseph R. Oldham. 1200 w. Naut Gaz—June 22, 1918. Critical discussion of these vessels and their equipment.

Progress in the Application of Concrete to Barge and Shipbuilding (86878 A). J. E. Freeman. 17 pp. Utah Soc Engrs, Mthly JI—April, 1918. Information concerning the construction and design, reviewing progress and the problems.

Building Concrete Ships (85134). Ills. 2400 w. Naut Gaz—Feb. 7, 1918. Advantages and disadvantages.

Concrete Ships (85886). 2700 w. Times Engng Supp—Mar. 29, 1918. Design and particulars of vessels under construction

Concrete Ships

in British yards. Methods found best adapted to conditions there.

Ferro-Concrete Ships (85537 A). T. J. Gueritte. Read at N-E Coast Instn. of Engrs. & Shipbldrs. 7500 w. Engng—March 15, 1918. Materials of construction, systems, speed, repairs, lasting qualities, weight and cost.

The Development of Concrete Barge and Ship Construction (85384 A). J. E. Freeman. Ills. 6000 w. A S M E, JI—April, 1918. Abstract of paper before Eng. Soc. of Buffalo. Brief review of progress in concrete-boat building, and discussing problems.

Concrete Barges and Ships (86109 A). Ills. 3500 w. Int Mar Eng—May, 1918. Comparison with steel and wooden vessels. Report of joint committee.

Concrete Cargo Vessels (86309). T. G. Owens Thurston. Ills. Extracts from a paper read before the British Instn. of Nav. Archts. 2000 w. Naut Gaz—May 11, 1918. Construction of ferro-concrete ships, equipment, launching, etc.

Les Grands Cargos En Ciment (86493 B). H. Volta. Ills. 1200 w. La Nature—Apr. 13, 1918. Large merchant vessels being built in Germany and Norway.

Concrete Ships (86208 A). L. R. Ferguson, with short discussion. Ills. 2000 w. Am Soc Mar Dftn, JI—Jan., 1918. The design, advantages, objections, etc.

Reinforced Concrete Ships (86256). Ills. 2500 w. Pwr Pt Eng—May 15, 1918. Launching of steamship "Faith," and the use of reinforced concrete as a shipbuilding material.

1000-Ton Ferro-Concrete Motor Vessel on the Alfsen System (86364 A). Ills. 600 w. Engng—April 26, 1918. Details of vessels built in Norway.

The History of Concrete Barge and Ship Construction (86438). J. E. Freeman. Abstract of paper before Eng. Soc. of Buffalo. 3000 w. Eng & Con—May 22, 1918.

Concrete for Ships (83918). A. T. Wall. 2000 w. Times Engng Supp—Nov. 30, 1917. Part I—Properties of the material.

Ferro-Concrete Shipbuilding in Norway (83556 A). Robert G. Skerrett. Ills. 1800 w. Int Mar Eng—Jan., 1918. Vessels built by the Fougner Steel-Concrete Shipbuilding Co., of Christiana.

Les Chalands Et Navires En Béton Armé (83940 B). Ills. 3800 w. Le Génie Civil—Dec. 1, 1917. Construction of barges and boats of reinforced concrete in Norway.

Reinforced Concrete Cargo Steamer (84093 A). Ills. 1300 w. Int Mar Eng

Diesel Engines

—Feb., 1918. Plans and specifications of a 5000-ton vessel building in California.

The Fallacy of Concrete Ships (84092 A). H. A. Everett. 2000 w. Int Mar Eng—Feb., 1918. Features wherein this construction is deficient or open to serious question.

Les Constructions Navales En Béton Armé (84604 B). G. Espitalier. Ills. 4100 w. Le Génie Civil—Jan. 5, 1917. Serial, 1st part. Design and construction of reinforced concrete barges on the Lorton system, in France.

Convoy System

Allied Convoy System (85252). 900 w. Ills. Naut Gaz—March 21, 1918. Abstract of article in Amsterdam *Algemeen Handelsblad* giving alleged system of arrangement for escorting merchantmen through the war zone.

Corrosion

Corrosion of Ships (88347). From Liverpool *Jl. of Com.* 1200 w. Naut Gaz—Aug. 24, 1918. Corrosion by chemical and by galvanic action.

Crews

Can Canada Supply the Crews for Her Merchant Marine? (89344). T. H. Fenner. Ills. 2000 w. Mar Eng, Can—Sept., 1918. Type of man required, the duties, prospects, etc.

Manning the New Merchant Marine (88701 A). Henry Howard. 2000 w. Int Mar Eng—Sept., 1918. Free schools established for training deck and engine room crews for American ships.

Cruisers

Model Experiments on Express Cruisers of Deadrise Type (88055 A). T. A. Gamon. 1000 w. Int Mar Eng—Aug., 1918. Type proves superior to round bilge model.

Decking

Magnesite Composition Decking (85593 A). G. W. Selby. 2000 w. Int Mar Eng—April, 1918. How it is manufactured and applied.

Design

A System for the Design of Ships with Straight-Lined Sections (86688 A). C. W. Bion. Ills. 1200 w. Int Mar Eng—June, 1918. New method proposed.

Diesel Engines

See same heading under MECHANICAL ENGINEERING, *Combustion Motors*.

Notes on Operation of Submarine Diesel Engines (83020 F). F. C. Sherman. 4000 w. Am Soc Nav Engrs, JI—Nov., 1917. Results of four years' experience in operating engines of the two-cycle Nuernberg type.

See same heading under Mechanical Engineering, *Combustion Motors*.

Evaporator

Docks

Commercial Dock Developments at Falmouth (82557 A). 1000 w. Engr—Nov. 2, 1917. Schemes for harbor improvement.

Dry Dock

Champlain Dry Dock for Quebec Harbor (85909 N). U. Valiquet. Ills. 13 pp. Can Soc C E—April 25, 1918. History and description of the work; construction, equipment, etc.

Floating Dry Docks of Concrete (86641). Anton S. Rosing. Ills. 1500 w. Naut Gaz—June 1, 1918. Abstract of article in *Bul. of Norwegian-American Chamber of Commerce*. Describes construction in Norway.

Electric Control

Electric Controlling Appliances (86,209 A). W. E. Thau. Ills. 4000 w. Am Soc Mar Dftn, JI—Jan., 1918. Third of a series of articles on electric appliances for shipboard service.

Electrical Equipment

Electrical Applications to Merchant Vessels (88973 N). H. A. Hornor. 4000 w. Am Soc Nav Engrs, JI—Aug., 1918. Rules and specifications for the installation of electrical equipment, construction, distribution, switchboards, searchlights, etc.

Electric Propulsion

Electric Marine Propulsion (85202). 3000 w. Times Engng Supp—Feb. 22, 1918. Various questions of design.

Electric Welding

Electric Welding in Shipbuilding (89069). 1200 w. Times Engng Supp—Aug., 1918. British experience in building rivetless ships.

An Electrically Welded Barge (88608 A). Ills. 700 w. Engng—Aug. 9, 1918. Details of a 120 ft. barge in which no rivets were used, the structure being put together by electric welding. Importance of the method.

Study of Electric Welding Aids in Our Shipbuilding (88649). Comfort A. Adams. 1800 w. Elec Wld—Sept. 7, 1918. Review of report of Capt. James Caldwell of England covering experience and general state of the art.

Application of Electric Welding to Shipbuilding (88864 A). 4500 w. Engng—Aug. 23, 1918. Experiments carried out by Lloyd's Register and the results, with regulations for the application of electric arc welding to ship construction.

Electrically Welded Cargo Ships (88877 A). 2500 w. 'E Cb St L, JI—July-Aug., 1918. Review of the problems of welding in their application to marine construction and what is being accomplished by the U. S. Shipping Board Emergency Fleet Corporation.

Electric Arc Welding in Shipbuilding (88856 A). 1500 w. Engr—Aug. 23, 1918. Regulations issued by Lloyd's Register of shipping for the application.

Electric Welding as Applied to Steel Ship Construction (88827 A). Ills. 12 pp. E Cb Phila, JI—Sept., 1918. Series of discussions held under the auspices of the Electric Welding Branch of the Education and Training Section of the U. S. Shipping Board.

Evolution of Electric Welding Processes as Applied in Shipbuilding (88880 A). H. A. Hornor. 3000 w. E Cb St L, JI—July-Aug., 1918. Spot welding and arc welding will be methods generally used in ship construction.

Electric Welding In Ship Work (88416). 1000 w. Times Engng Supp—July, 1918. Vessel built in England with electrically welded plates.

Britain's First Rivetless Ship (88253). 1500 w. Naut Gaz—Aug. 7, 1918. Possibilities and disadvantages of the electric welding process are discussed.

Emergency Fleet

The Organization of the Emergency Fleet Corporation (85581 A). Waldon Fawcett. 5000 w. Int Mar Eng—April, 1918. Explains the problems and the administrative machinery of the greatest shipbuilding enterprise ever undertaken.

Engineers' Duties

Duties of Newly-Trained Marine Engineers on Merchant Vessels (82240 A). C. H. Willey. 3000 w. Int Mar Eng—Nov., 1917. Serial, 1st part. Service routine explained.

England

England's Ship Needs (83931). 2500 w. Nautical Gazette—Dec. 20, 1917. Abstract of recent debate in House of Commons. The "Standard" ship criticised.

Evaporator

Test of Reilly Multicoil Evaporator (Submerged Type) (85043 F). H. T. Dyer. Ills. 20 pp. Am Soc Nav Engrs, JI—Feb., 1918. Tests with results and general conclusions deduced from them.

Test of Regenerative Evaporating Apparatus (85041 F). M. C. Stuart. Ills. 18 pp. Am Soc Nav Engrs, JI—Feb., 1918. Details of a patented system, giving results of test, and calculations for the performance and for the installation.

Test of Schutte and Koerting Evaporator (83021 F). M. C. Stuart. Ills. 3000 w. Am Soc Nav Engrs, Jr—Nov., 1917. Data regarding evaporator performance developed during a recent

Launching**Explosion Effects**

Committee Appointed by the Council to Inquire Into the Effects of Explosions of Mines and Torpedoes on the Structure of Merchant Ships (86578 N). 1200 w. Instn Nav Archts—1917. Reports on cargo ships and existing large mail and passenger vessels. Suggestions for certain temporary war expedients.

Fabricated Ships

Control of Hull Construction of a 5,000-Ton Deadweight Fabricated Steel Ship (89312 A). 1500 w. Int Mar Eng—Oct., 1918. Serial, 1st part. Methods and practices required at yards in ordering materials to facilitate deliveries from steel mills.

Assembling and Regulating Ship's Structure (88706 A). T. L. Cohee. 2000 w. Int Mar Eng—Sept., 1918. Rigid system necessary to eliminate errors in assembling fabricated ships.

Flow

Lateral Flow of Water Under Low Heads (85042 F). Albert E. Guy. Ills. 18 pp. Am Soc Nav Engrs, JI—Feb., 1918. Deals with the question of head causing the flow through a lateral orifice.

"Freedom of the Seas"

The Freedom of the Seas (89195 A). Gerard Fiennes. 5500 w. Roy Soc Arts, JI—Sept. 13, 1918. Reviews the development, and the history of early seafaring times.

Freight Congestion

Southern Ports Will Be Used to Relieve Northern Freight Congestion (84154). 1200 w. Mfrs Rec—Feb. 7, 1918. Congestion at frozen ports will be relieved by diverting cargoes south.

Freighters

Results of Test on Bulk Freighter (83402 A). A. George Matteson and Thomas Durkin. Read before Soc. Nav. Archts. & Marine Engrs. Ills. 1500 w. Mar Rev—Jan., 1918.

New Southern Pacific Freighters (82818 A). Ills. Supplement. 2000 w. Int Mar Eng—Dec., 1917. Single-screw vessels built at Newport News. Design, machinery and equipment.

Germany

German Ship Subsidies (85135). 3200 w. Naut Gaz—Feb. 7, 1918. History and text of recent ship subsidy bill.

Great Britain

Britain's Ship Industry (87645). 9500 w. Naut Gaz—July 20, 1918. Recommendations of committee of Board of Trade for rehabilitation after the war.

Greenheart

Greenheart for Ships (85876). Ills.

1500 w. Naut Gaz—April 4, 1918. Recent recognition of advantages of this wood from British Guiana for ship-building.

Gunboats

The Tigris Flotilla of Gunboats (82372 A). Ills. 1700 w. Engng—Oct. 26, 1917. Details of design and construction of these vessels of the "Fly" class—16 vessels built in six months.

Hog Island

Hog Island Yard Has Made Good (88561 A). H. Cole Estep. Ills. 3500 w. Mar Rev—Sept., 1918. Account of the development and work, and the launching of the Quistconck.

Hospital Ships

Motor Hospital Ships for the Mesopotamia Expedition (82286 A). Ills. & Plates. 2000 w. Engng—Oct. 19, 1917. Latest hospital ships constructed for the Tigris river.

Instruments

The Type V Azimuth Circle (88177 A). H. R. Greenlee. Ills. 2200 w. U S Nav Inst, Pro—July, 1918. Designed, primarily, for use in connection with the gyro-compass, but may be used with the magnetic compass.

Japanese Navy

Japanese Naval Expansion (85304 A). 1500 w. Engr—March 8, 1918. Development of the Japanese navy, and the new building programme.

Joints

Oil- and Water-tight Joints in Ships' Hulls (87323 A). Evers Burtner. Ills. 2200 w. Int Mar Eng—July, 1918. Methods of securing tight joints under different conditions.

Labor

Hours of Labor (82671). 1500 w. Times Engng Supp—Oct. 26, 1917. Discussion of question of reduction of hours of labor in British shipyards.

Lake Navigation

Lake Records Fall Despite Delays (84623). Wm. Livingstone. 3500 w. Mar Rev—March, 1918. Obstacles to navigation during 1917, shipments, etc.

Ljungström System

The Turbo-Electric Ship Wulsty Castle (86722 A). Ills. 2500 w. Engr—May 17, 1918. The first ocean-going vessel built in England on the Ljungström turbo-electric system.

Electric Marine Propulsion (87148). 1000 w. Times Engng Supp—May, 1918. Ljungström turbines. Opinions of British designers. See also page 193.

Launching

When the Quistconck Was Launched (88562 A). R. V. Sawhill. Ills. 1800 w. Mar Rev—Sept., 1918. Elaborately illus-

Lusitania

trated account of the first launching at Hog Island.

Lusitania

Lusitania Suits Dismissed by Court (88519). 3500 w. Naut Gaz—Aug. 31, 1918. German Government held responsible for sinking.

Mahogany

Mahogany as a Shipbuilding Wood (85877). C. D. Mell. Ills. 1400 w. Naut Gaz—April 18, 1918. Advantages of mahogany for ship construction and present sources of supply.

Maine

A Midshipman on the Maine (84-986 A). W. T. Cluverius. Ills. 12 pp. U S Nav Inst, Pro—Feb., 1918. Record written only a few months after the ship's destruction.

Marine Engines

Marine Engine Evolution (88980). Joseph R. Oldham. 1800 w. Naut Gaz—Sept. 21, 1918. Relative merits of steam high pressure and oil internal combustion engines.

See same heading under **MECHANICAL ENGINEERING, Combustion Motors.**

Marine Engine

350 B. H. P. Kromhout Marine Engine (84027 A). Ills. 1200 w. Engr—Jan. 11, 1918. Engine operating on the two-cycle system. Details.

Marine Engineering

The Trend in Marine Engineering (82239 A). C. R. Bruce. From a paper before the Greenock Assn. of Engrs. & Shipbldrs. 2500 w. Int Mar Eng—Nov., 1917. Turbine development and adoption of speed reduction gearing, etc.

Marine Engineers

The Marine Engineer and His Work (85663). 4000 w. Power—April 16, 1918. Informal talk before M. I. T. graduating class on the duties and responsibilities of engineers on board a North Atlantic greyhound.

Marine Engineers

From a Lake Dredge to a Transatlantic Liner (85928 A). Ills. 3500 w. Mar Rev—May, 1918. True story of a retired marine engineer.

Marine Forgings

The Production of Large Marine Forgings (87990). A. G. Webster. Ills. 1700 w. Mar Eng, Can—June, 1918. Suitable equipment made possible quick delivery.

Marine Lighting

Recent Developments in Marine Lighting (84845 A). 3000 w. Engr—Feb. 22, 1918. Serial, 1st part. Illumination of lighthouses, lightships, etc.

Merchant Marine**Marine Railway**

Features of an Electrically Operated Marine Railway (88374). Ills. 1500 w. Elec Rev, Chi—Aug. 24, 1918. Installation on Illinois River served by Central Station Co.

Merchant Fleet

American Ships for Foreign Trade (88700 A). Edward N. Hurley. 1500 w. Int Mar Eng—Sept., 1918. Great merchant fleet will give new opportunities for foreign trade.

Merchant Shipbuilding (89043 A). 3500 w. Engr—Aug. 30, 1918. British shipbuilding during the war; also brief review of foreign shipbuilding.

Merchant Marine

Putting Our Merchant Ships on Schedule (88449 A). L. P. Alford. 2500 w. Ind Man—Sept., 1918. A series of Gantt charts for showing the movement of our ships, and their location at any time, as well as cargoes in kind and amount.

American Merchant Marine Will Total 25,000,000 Tons in 1920 (87317 A). Edward N. Hurley. 3000 w. Int Mar Eng—July, 1918. From an address at University of Notre Dame, South Bend, Ind., on June 10.

Sale and Purchase of British and Foreign Trading Vessels During 1917 (87405 A). T. Singleton. 2500 w. Ir & Cl Trds Rev—May 10, 1918. Steamers and sailing vessels that have changed hands.

The Merchant Ship of the Future (85693 A). W. S. Abell. 5000 w. Engng—March 29, 1918. Read before Instn. of Nav. Archts. Future problems in design and construction.

La Marine De Commerce (89726 C + D). M. E. Bertin. Ills. 13,000 w. Soc D'Encouragement Industrie Nationale—July-Aug., 1918. The world's merchant marine during the war.

Restoration of German Merchant Marine (89475). 1000 w. Naut Gaz—Oct. 12, 1918. From paper by Guaranty Trust Co. on Germany's plans for establishing her economic leadership among the nations.

Our Merchant Marine, Present and Future (83228 B). Irving L. Evans, with discussion. 12 pp. Cleve Eng Soc, Jl—Nov., 1917. The manning of the merchant marine. How it may be accomplished. The question of officers.

Future Design and Construction of Merchant Ships (86308). W. S. Abell. Abstract of paper read before the British Instn. Nav. Archts. 6000 w. Naut Gaz—May 11, 1918. Directions in which future research should be encouraged.

Pile Driving

Models

Cargo Ship Lines of Simple Form (83557 A). William McEntee. Ills. 800 w. Int Mar Eng—Jan., 1918. Results of tests of models.

Motorboats

Fitting Motorboats to Transports (84553 B). A. P. Lundin. Ills. 1400 w. S A E, JI—Feb., 1918. Need of mechanical davits, value of motor lifeboats, etc.

Motorships

Motorships and Their Propelling Machinery (85590 A). J. Murray Watts. Ills. 3000 w. Int Mar Eng—April, 1918. Designs of six classes vessels being equipped with internal combustion engines.

Shallow Draft Motorships for Use on the Volga River Designed by American Naval Architect for Russian Owners (83555 A). Ills. 700 w. Int Mar Eng—Jan., 1918. Oil tankers of 3500 tons carrying capacity, and cargo boats of 1500 tons capacity, limited to 7 feet and 5 feet draft respectively.

Naval Engineering

A Fifty Year Retrospect of Naval Marine Engineering (86927 F). C. W. Dyson. 47 pp. Am Soc Nav Engrs, JI—May, 1918.

Naval Repairs

War-Time Repairs in the Navy (86,048). Frank A. Stanley. Ills. 3500 w. Am Mach—May 2, 1918. Serial, 1st part. Shows how repair work is handled on floating repair shops.

Naval Station

The Pelham Bay Naval Reserve Training Station (87996 B). Ills. 3000 w. Arch For—July, 1918. Detailed description of this camp.

Navigation

An Interpolating Instrument to Expedite the Use of Aquino's Tables in Navigation (87496 A). Alexander Forbes. Ills. 2500 w. U S Nav Inst, Pro—June, 1918. Describes instrument based on the principle of similar triangles.

A New Method of Using Altitude and Azimuth Tables to Obtain a Ship's Position at Sea (87495 A). Abner B. Clements. 3000 w. U S Nav Inst, Pro—June, 1918. Explanation.

The Chart as a Means of Finding Geographical Position by Observations of Celestial Bodies in Aerial and Marine Navigation (85315 A). G. W. Littlehales. Maps and Tables. 2000 w. U S Nav Inst Pro—March, 1918.

New Ship

Ketels en Hulpwervtuigen van de Nieuwe Vrachtschepen "Nederland" (83313 B). J. E. DuC. Muller. Ills.

5200 w. Ingenieur—Nov. 3, 1917. Boilers and engines of a recently constructed Dutch ship.

Nippon

Nippon Yusen Kaisha (88520). 1500 w. Naut Gaz—Aug. 31, 1918. History and development of a famous Japanese shipping company.

Oil Engines

Direct Reversible Marine Oil Engine (82241 A). Ills. 1200 w. Int Mar Eng—Nov., 1917. Three-cylinder type of from 75 to 500 brake horse-power.

New Type of Marine Oil Engine (89313 A). Ills. 1500 w. Int Mar Eng—Oct., 1918. Two-cycle engine with novel features.

Oil Fleet

When Tanker Displaced the Whaler (87818). Ills. 1200 w. Naut Gaz—July 27, 1918. Growth of Standard Oil fleet.

Oil Fuel

Oil As Fuel for Marine Craft (85136). 2300 w. Naut Gaz—Feb. 7, 1918. Increasing use of oil for marine purposes. Supply from Mexican sources.

Oil Tanker

Oil Tanker of 10,000 Tons Dead-weight Adopted as Standard by shipping Board (84738 A). Ills. 2500 w. Int Mar Eng—March, 1918. Details of steamer designed by Sun Shipbuilding Co.

Standard Oil Tanker Benjamin Brewster (82237 A). Ills. & Plates. 600 w. Int Mar Eng—Nov., 1917. Details of construction and machinery.

Ordnance

British and German Naval Ordnance (84673 A). 3000 w. Engr—Feb. 1, 1918. Serial, 1st part. Naval gunnery and ordnance development.

Pacific Mail

Pacific Mail's Early History (88651). Ills. 1200 w. Naut Gaz—Sept. 7, 1918. Wooden paddle steamers built as late as 1870.

Pacific Transportation

Japs Gain Firmer Hold on Pacific (83996 B). R. C. Hill. 2000 w. Mar Rev—Feb., 1918. Control of rates and matters related.

Passenger Steamer

Twin-Screw Passenger Steamer "Stavangerfjord" (88846 A). Ills. & Plate. 1200 w. Engng—Aug. 16, 1918. Serial, 1st part. Detailed description of first-class steamer recently completed at Christiania, Norway.

Pile Driving

Drive 15,000 Piles for Pair of Thousand-Foot Shipways (83453). Ills. 1200 w. Eng News-Rec—Jan. 3, 1918. Using machines with two-way motion rolling on finished rows.

Salvage

Pneumatic Tools

Use and Care of Pneumatic Tools for Shipyards (82242 A). Glenn B. Harris. 1800 w. Int Mar Eng—Nov., 1917. Use and proper handling.

Progress

Progress in Marine Engineering (85,200). 1600 w. Times Engng Supp—Feb. 22, 1918. Progress reported by North East Coast Shipbuilders. Standard ship designs.

Propellers

Design of Water Propellers by the Specific Speed Method (88976 N). Charles F. Gross. 1500 w. Am Soc Nav Engrs, Jl—Aug., 1918. Shows how this method may be applied to water propeller problems.

Half a Million Propellers a Year (87988). Henry Woodhouse. Ills. 1300 w. A A Wkly—Aug. 5, 1918. Serial, 1st part. How they are made.

Propelling Engines

Standard Propelling Engines for British Standard Ships (83068 A). Ills. & Plate. 1200 w. Engng—Nov. 30, 1917. Descriptive.

Propulsion

Propulsion of Ships (84991 B). Es-kil Berg. Ills. 16 pp. Fkn Inst, Jl—March, 1918. Latest developments in marine propulsion.

Electric Propelling Machinery for the U. S. Battleship "Tennessee" (87948 A). Wilfred Sykes. Ills. 2500 w. Elec Jl—Aug., 1918. Describes equipment.

Ljungström Turbo - Electric Ship-Propelling Machinery (86372 A). Ills. and Plate. 2500 w. Engng—May 3, 1918. Serial, 1st part. Its application to a sea-going ship in England, explaining the principle of Ljungström turbine. See also page 190.

Pump Tests

Tests of Main Circulating Pumps of North Dakota and Nevada (86052 F). S. M. Robinson. Ills. and Plates. 2500 w. Am Soc Nav Engrs, Jl—Feb., 1918. Details of tests.

Reconstruction

Old Whaleback Barges Transformed (88978). Leon M. Huggins. 1500 w. Naut Gaz—Sept. 21, 1918. Their reconstruction into modern oil carriers.

Reduction Gear

Neuland Magnetic Reduction Gear (87992). Ills. 1500 w. Mar Eng, Can—July, 1918. Details of construction and operation.

Refrigeration

L'Installation Frigorifique du Navire Italien "Resurrezione" (85143 B). C. Dantin. Ills. 2600 w. Le Génie Civil—March 2, 1918. Refrigerating plant

on Italian steamer trading with South American ports. See also page 227.

Reinforced Concrete

Ships of Reinforced Concrete (84830 A). 3500 w. Eng Rev—Feb. 15, 1918. Serial, 1st part. Its value as a ship-building material.

Research

Research in Marine Engineering (85,694 A). A. E. Seaton. Read before Instn. of Nav. Archts. 4500 w. Engng—March 29, 1918. Notes on the importance of research work.

Riveters

Riveters (88887 B). 1800 w. Cas Eng Mthly—Aug., 1918. On the shortage of riveters and the remedy for the same.

Riveting

Riveting Records in Shipbuilding (87343 A). 1200 w. Engng—May 31, 1918. Records with power riveting and factors influencing performance.

Efficient Ship Riveting (85138). J. R. Oldham. Ills. 1800 w. Naut Gaz—Feb. 28, 1918. Best method of riveting up steel ship plates.

Safety

Safety at Sea (86485). 1300 w. Times Engng Supp—April 26, 1918. Different systems of signals for use between ships and shore stations, as well as between ships at sea.

Scientific Signalling and Safety at Sea (86708 A). Ills. 4000 w. Engng—May 17, 1918. Abstract of Prof. John Joly's lectures at the Royal Institution. Suggestions for increasing safety at sea.

Salvage

Salvage of the Argentine Naval Transport "Pampa" (86577 A). L. H. Chandler. Ills. 2500 w. U. S. Nav Inst, Pro—May, 1918. Salvage of a naval transport that went aground on the North Carolina coast in Dec., 1917.

Ingenious Solution of Difficult Salvage Problem (85270). Ills. 1400 w. Com Air Mag—March, 1918. Account of the salvage of the German tanker "Gut Heil," at Baton Rouge.

Merchant Vessel Salvage (87724). 2000 w. Times Engng Supp—June, 1918. Work accomplished by British Admiralty in salvaging valuable cargoes.

Deep Water Salvage (87644). Ills. 1200 w. Naut Gaz—July 20, 1918. Devices for raising vessels from great depths. Possibilities of success at 1,000 feet.

Salvage of Merchant Ships (87551 A). Ills. 2300 w. Engr—June 21, 1918. Gives details of notable pieces of salvage work.

Le Sauvage Des Navires Coulés (89707 B). A. Poidloué. Ills. 3900 w.

Salvage

Genie Civil—Sept. 28, 1918. Methods of raising sunken ships.

Salvage Work in Home Waters (89115 A). From London Morning Post. 1500 w. Aust Min Std—Aug. 22, 1918. Account of some of the exploits which resulted in saving over 400 ships.

Post-War Salvage of Merchant Ships (87061). From *Liverpool Jl. of Commerce*. 1500 w. Naut Gaz—June 22, 1918. Discusses methods of raising torpedoed vessels.

Salvage of the German Tanker Gut Heil (86689 A). Robert G. Skerrett. Ills. 1500 w. Int Mar Eng—June, 1918. Compressed air raises 6000-ton vessel after lying five years on bed of Mississippi River.

The Admiralty Salvage Section (87900 A). Ills. 1500 w. Engng—July 5, 1918. Reviews some of the work on the British coast.

With the Admiralty Salvage Section (88135 A). 2500 w. Engr—July 12, 1918. Recent examples of salvage, with account of methods used.

Merchant Vessel Salvage (88418). 1000 w. Times Engng Supp—July, 1918. Methods of salvaging sunken ships.

A New Device for Raising Sunken Ships (82561 A). Ills. 600 w. Engr—Nov. 2, 1917. Describes a diving globe for salvaging sunken vessels.

Salvage

Salved After Two Years on Rocks (82708 A). Ills. 700 w. Story of the salvaging of "Western Star" in Georgian bay, Lake Huron.

Schooners

New Pacific Coast Steam Schooners (86108 A). Ills. 1700 w. Int Mar Eng—May, 1918. Interesting features of wooden lumber carriers.

Screw Propellers

Screw Propeller Manufacture (86930 F). U. T. Holmes. 1800 w. Am Soc Nav Engrs, Jl—May, 1918. Methods employed at one of the leading shipyards.

Balancing of Rotating Masses, With Special Reference to Screw Propellers (83167 A). J. J. King-Salter. Ills. 2000 w. Aust Min Stand—Nov. 22, 1917. Serial, 1st part. Read before the Eng. Assn. of N. S. W. Reviews causes of the want of running balances in rotating masses and means of correcting.

Shipbuilding

Design Steel Ship of Maximum Efficiency of Bridge-Shop Fabrication (87311). Ills. 4000 w. Eng News-Rec—July 4, 1918. The assembly plant at

Shipbuilding

Hog Island; hull parts made in distant shops.

Handling Materials at Hog Island (87189 A). H. Cole Estep. Ills. 1600 w. Mar Rev—July, 1918. Methods.

Hog Island's Ship-Erection Equipment: Four Hundred Tower Derricks for Fifty Ways (87501). Ills. 1800 w. Eng News-Rec—July 11, 1918. Ample equipment provided for this large yard.

More Steel, More Ships Are Assured (87190 A). Charles M. Schwab. 1200 w. Mar Rev—July, 1918. Address at meeting of the Iron & Steel Inst.

Rapidly Growing Ship Production Speeded by the Emergency Fleet Corporation (87315). 3500 w. Eng News-Rec—July 4, 1918. Shipbuilding programme and launchings.

World's Ship Output Now Exceeds Losses (87361). Bainbridge Colby. 2500 w. Naut Gaz—July 6, 1918. Reviews the work of the United States Shipping Board.

The Foundation Company—Shipbuilders (87320 A). Ills. 2000 w. Int Mar Eng—July, 1918. Recent development in the shipbuilding industry.

Bay State's Merchant Ship Production (88806). 1500 w. Naut Gaz—Sept. 14, 1918. Output now larger than any past time.

Control of Hull Construction of 5,000-Ton Deadweight Fabricated Steel Vessel (88707 A). 1000 w. Int Mar Eng—Sept., 1918. Serial, 1st part. System at yard where straight work was produced at outside shops and furnace work at yard.

Oak Steamer Built for U. S. Completed on Great Lakes (88563 A). Fred B. Jacobs. Ills. 1300 w. Mar Rev—Sept., 1918. A cargo-carrier designed for overseas service.

Lord Pirrie on British Shipbuilding Prospects (88979). Ills. 1700 w. Naut Gaz—Sept. 21, 1918. Improvement effected by standardizing vessel construction.

Shipbuilding Prospects (88848 A). 2000 w. Engng—Aug. 16, 1918. Editorial on shipbuilding in England, and information concerning the losses by war and related topics.

Steel Uprights for Shipbuilding Berths (88621 A). Ills. 700 w. Engr—Aug. 9, 1918. Improved staging and its advantages.

A New Shipyard on the North-East Coast (88308 A). Ills. 700 w. Engr—July 26, 1918. Description of the new yard of the Furness Shipbuilding Co.

Builds Plant While Fabricating Ships (87826 A). E. C. Kreutzberg. Ills. 1000 w. Mar Rev—Aug., 1918. Simultaneous ship and plant construction in new Atlantic yard.

Shipbuilding

Hog Island's Compressed Air System (87827 A). Ills. 1000 w. Mar Rev—Aug., 1918. Details of equipment.

Seattle Shipbuilders Overcome Pioneer Difficulties and Set New Speed Records (87806 A). Claude A. Osier. Ills. 3000 w. Eng News-Rec—July 25, 1918. Development of the Skinner & Eddy shipbuilding plant.

Shipbuilding in the United States (87890 A). Ills. & Plates. 2200 w. Engr—June 28, 1918. Deals particularly with the Hog Island yard.

Ship Construction (88285 A). Ills. 1200 w. Engr—July 19, 1918. Details of construction with multiple punched plates.

The Building of the Tuckahoe (88226 A). E. A. Suverkrop. Ills. 1500 w. Am Mach—Aug. 15, 1918. How a 5,500-ton steam collier was built in 27 days from the laying of the keel.

War Time Effort at Toronto Ship Building Co.'s Plant (87991). A. G. Webster. Ills. 2500 w. Mar Eng, Can—July, 1918. Wooden ships being built to the same design as on the Pacific coast.

America to Lead World in Shipbuilding (85301 A). 3000 w. Iron Age—March 28, 1918. Address of Edward N. Hurley to National Marine League.

Reinforced Concrete Vessels (85759 A). Walter Pollock. Ills. 4000 w. Engr—March 29, 1918. Abstract of paper read before the Inst. of Naval Archts. The points aimed at, advantages and disadvantages, materials, structural details, etc.

Seattle Speeds Up Shipbuilding (85592 A). Ills. 1800 w. Int Mar Eng—April, 1918. Swift construction of shipyards and ships.

Shipbuilding and Labor Problems (85393 A). Charles Piez. 2500 w. Iron Age—April 4, 1918. From address to Natl. Metal Trds. Assn. Emphasizes statement that workers must be released for ship work.

Some Minor Details of Ship Construction and Equipment (85399). C. Waldie Cairns. 3000 w. Mar Eng, Can—March, 1918. Serial, 1st part. Advisability of adopting a "Standard Fittings Specification." Read before N-E Coast Instn.

South Launches New Type of Ship (85308 A). H. H. Dunn. Ills. 1000 w. Mar Rev—April, 1918. Wooden ship recently launched at Orange, Texas, embodying original features.

Where to Recruit Shipyard Labor (85307 A). 17 tables. 2500 w. Mar Rev—April, 1918. Analysis of the ship-

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yard trades showing how kindred trades can supply skilled men.

Will There Be Enough Ship Steel? (85306 A). E. C. Kreutzberg. Ills. 1700 w. Mar Rev—April, 1918. A study of the fabricated ship problem from the steel manufacturer's standpoint.

Straight Lined and Fabricated Ships (85598 A). John A. McAleer. Ills. 2200 w. Int Mar Eng—April, 1918. The application of the principle to shipbuilding.

Building Wooden Ships for the Emergency Fleet Corporation (89587 A). E. A. Suverkrop. Ills. 5000 w. Am Mach—Oct. 17, 1918. Serial, 1st part. Methods used at the Traylor plant at Cornwells on the Delaware.

Great Submarine-Chaser Factory Produces "Eagles," by Indoor Shipbuilding System (89581 A). Ills. 2500 w. Eng News-Rec—Oct. 17, 1918. Problem of rapid production solved by special design and quantity manufacture.

"I am 29 Days Old—Look Me Over" (89140 A). Ills. 1500 w. Mar Rev—Oct., 1918. Description of the steel cargo carrier Crawl Keys and its construction.

Some Insufficiently Considered Details of Ship Construction and Equipment (89315 A). C. Waldie Cairns. Read before N-E Coast Inst of Engrs & Shipbuilders. 6500 w. Int Mar Eng—Oct., 1918. Analysis of conditions of yard management and criticizing details of equipment.

Philadelphia Electric Company's Government Work (84319). Henry W. Young. Ills. 800 w. Elec Rev, Chi—Feb. 16, 1918. Electric supply for Hog Island and Delaware River shipbuilding plants.

Shipbuilding Program Analyzed (83992 B). Diagrams. 4500 w. Mar Rev—Feb., 1918. Study of plans of the Emergency Fleet Corporation, with E. N. Hurley's statement on shipping program.

Speeding Up Work at Hog Island (84239 A). 2500 w. Iron Age—Feb. 14, 1918. Conditions at this shipbuilding plant and improvements planned.

Who Will Build the Fabricated Ships? (84089 A). Robert E. Kline. 1800 w. Int Mar Eng—Feb., 1918. Suggests organized working forces from kindred industrial plants.

Outlines of the Shipping Board Inquiry (83914). E. N. Hurley. 3400 w. Nautical Gazette—Dec. 27, 1917. Address to the Senate Investigating Committee. Ships contracted for. Review of work accomplished so far.

America's Great Shipbuilding Development (83435 D). C. E. Wright. Ills.

Shipbuilding

4500 w. Iron Age—Jan. 3, 1918. (Special No.) Progress made despite handicaps in getting plants ready.

Progress of Ship Construction at Emergency Fleet Yards (83848). 2000 w. Eng & Con—Jan. 23, 1918. Outlines progress in shipbuilding by Chairman Hurley of the Shipping Board.

Over \$400,000,000 for Steel and Wooden Ships Now Building in South (83560). Ills. 12 pp. Mfrs Rec—Jan. 10, 1918. Summary of shipbuilding activities along the South Atlantic and Gulf coast.

Shipbuilding Expedited by Electric Service (83482). David Elwell. Ills. 3000 w. Elec Wld—Jan. 5, 1918. Power requirements and details of electrical distributing system for Staten Island Shipbuilding Co.

Application of Reinforced Concrete to Ship Construction (85934). Allen Hoar. Ills. 1800 w. Eng & Con—Apr. 24, 1918. Essentials to success in the application of this material.

The Control of Shipbuilding (86486). 1300 w. Times Engng Supp—Apr. 26, 1918. Reorganization by the British Shipbuilding Advisory Council. Negotiations with labor; standardizing of ships, etc.

Great Shipbuilding Activity at Pascagoula and Vicinity (86281). Charles E. Chidsey. Ills. 2500 w. Mfrs' Rec—May 16, 1918. Details of plant and work at Pascagoula, Miss.

How Can We Build More Ships? (86104 A). Joseph W. Powell. 1800 w. Int Mar Eng—May, 1918. Government agencies and shipbuilders must work together.

Rare Woods Used in Shipbuilding (85931 A). C. D. Mell. 500 w. Mar Rev—April, 1918. Serial, 1st part. Present article deals with mahogany and how it should be used.

Some Effects of War on Merchant Shipbuilding (86426 N). James Craig, with discussion. Ills. 30 pp. Instn E & S Scot, Trans—April, 1918. Effects on labor, materials, methods of work, and on design.

Training Shipyard Workers (85166). James A. Pratt. 2500 w. Am Mach—March 7, 1918. Methods used in training men for work on fabricated steel.

Concrete Shipbuilding Firmly Established by Norwegian Firms (82973). Ills. 2000 w. Eng News-Rec—Dec. 13, 1917. Account of work accomplished in past 18 months.

Notes on Shipbuilding (83013 A). F. J. French, with discussion. 23 pp. La Eng Soc, Pro—Dec., 1917. Problems

Ship Handling

to be solved by the prospective shipbuilder.

Progress in Reinforced Concrete Ship Building (83234). Ills. 1200 w. Eng & Con—Dec. 26, 1917. Work in progress by a number of companies.

The Men Who Will Build the Ships. How the Department of Labor Will Get Them (82817 A). C. T. Clayton. 2500 w. Int Mar Eng—Dec., 1917. Methods the U. S. Government will use to secure 125,000 shipyard workers.

The War's Effect on Merchant Shipbuilding (82276 A). Homer L. Ferguson. 7500 w. E Cb Phila, JI—Nov., 1917. What is being accomplished; types of ships, and problems related.

Coping With War's Demand for Ships (82707 A). Homer L. Ferguson. 5000 w. Mar Rev—Dec., 1917. War problems confronting American shipbuilders.

The Shipyard Task (87152). 1400 w. Times Engng Supp—May, 1918. The United Kingdom's tonnage problem. Rate of construction, losses by U boats, etc.

Federal Ships Erected by Derrick Travelers Built for Long Service (86874). Ills. 1500 w. Eng News-Rec—June 13, 1918. Problems of the erection of the 9600-ton steel ships.

Present Practice in Building and Launching Ships (86802). F. J. French. 1500 w. West Eng—June, 1918. Methods of building and comparative merits of launching stern-foremost and sideways.

Hurley Denounces Germany (86845). Address at South Bend, Ind. 5500 w. Naut Gaz—June 15, 1918. Outlines the growth of our merchant marine.

Tower Derricks Serve Twin Shipways at Submarine Boat Corporation Yard (86693). Ills. 2000 w. Eng News-Rec—June 6, 1918. Features of the building-berth layout at Newark Bay.

Shipbuilding Woods

African Oak and Its Use in Shipbuilding (89474). C. D. Mell. 700 w. Naut Gaz—Oct. 12, 1918. Information concerning this wood, its use, the supply, etc.

Ship Design

Saving Steel in Ships (82676). 1700 w. Times Eng Supp—Oct. 26, 1917. Work accomplished by the British Load Line Committee in adapting designs to war requirements.

Ship Handling

Notes on Ship Handling (82613 A). G. H. Burrage. Ills. 800 w. U S Nav Inst, Pro—Nov., 1917. A method of finding the course from one relative

Ship Labor

position to another, knowing the course and speed of the guide, using Martin's mooring board.

Ship Labor

Ship Labor Under the Microscope (84622 A). Map. 4000 w. Mar Rev—March, 1918. Opinions of experts before the Senate committee on the problem of manpower.

Shipping

German View of Law of Angary (88897). Charles Henry Hubert and Richard King. 1500 w. Naut Gaz—Sept. 14, 1918. Summarizes existing German law.

Shipping Handled With Precision of Railroad Train Movements (88242). 1500 w. Mfrs Rec—Aug. 15, 1918. Remarkable achievements made.

State Controlled Shipping (86310). From article by John Hilton, in the *Edinburgh Review*. 7500 w. Naut Gaz—May 18, 1918. History of Britain's merchant fleet since the war. Official mistakes shown.

Post-War Shipping Practices (87226). From the *Compendium*. 1000 w. Naut Gaz—June 29, 1918. Deals with the question of government control, fabricated and concrete ships.

Is Uncle Sam a Good Ship Operator? (87188 A). V. G. Iden. Ills. 2500 w. Mar Rev—July, 1918. Analyzes the work the shipping board must do in operating the ships efficiently.

Labor Factors in Our Shipping Program (84571 A). Roy Wilmarth Kelly. Ills. 3500 w. Ind Man—March, 1918. The handicap of enormous labor turnover.

Our Transport Problem (83913). Irving T. Bush. 2200 w. Nautical Gazette—Dec. 13, 1917. Address to N. Y. Chamber of Commerce explaining the ocean transport problem of the U. S.

New Shipping Legislation (86642). 1800 w. Naut Gaz—June 1, 1918. Details of proposed laws extending the President's powers over our merchant marine.

Ship Protection

Bescherming van koopvaardijsschepen tegen automobiele torpedo's (87109 B). J. K. E. Triebart. Ills. 1900 w. Ingenieur—Mar. 30, 1918. Protection of merchant ships against torpedoes.

Ships

1917 and the Question of Ships (83765 A). With editorial. 4500 w. Engr—Jan. 4, 1918. Effects of submarine warfare; the pressing need of ships.

Ship's Piping

Piping Arrangements Aboard Ship (87321 A). Arthur H. Baker. 1000 w. Int Mar Eng—July, 1918. Serial, 1st

Shipyards

part. Detailed description of the ship's piping system.

Main and Auxiliary Steam Piping (87199 A). Ralph W. Propert. 3000 w. Am Soc Mar Dftn, JI—April, 1918. Fundamental features of piping systems aboard ships.

Ship Stresses

An Investigation of the Shearing Force and Bending Moment Acting on the Structure of a Ship, Including Dynamic Effects (86584 N). A. M. Robb. Ills. 12 pp. Instn Nav Archts—Mar. 22, 1918. Outlines investigations of a vessel of the intermediate, cargo and passenger type.

Shipyards

American Shipyard Data (87984). Map. 1500 w. Naut Gaz—Aug. 3, 1918. List of plants with number of vessels under contract, according to districts.

Concrete Shipyard at Wilmington, N. C. (88052 A). A. G. Monks. 2500 w. Int Mar Eng—Aug., 1918. Details of plant erected by Liberty Shipbuilding Co., Boston, Mass., for building concrete ships.

Maine Shipyards Again Active (88252). 2000 w. Naut Gaz—Aug. 17, 1918. Report of rapid vessel production.

The National Shipyards (87898 A). 1500 w. Engng—July 5, 1918. Editorial on the report of the Select Committee of the House of Commons on National Expenditure.

A Big Transportation Problem at Hog Island (85743). Ills. and Map. 3500 w. Ry Age—April 19, 1918. Shows the rapid construction of this large shipyard dependent on ability to deliver men and materials.

Construction of Newark Bay Shipyard (85583 A). Ills. 1800 w. Int Mar Eng—April, 1918. Arrangements for building 5,000-ton fabricated ships.

Hog Island Yard Starts Building Ships (85582 A). Ills. 2200 w. Int Mar Eng—April, 1918. Work at this great government plant—30,000 men employed.

Rapid Progress Now Being Made at Hog Island (85824 A). Ills. 2000 w. Iron Age—April 25, 1918. Large shipyard on Delaware River nearing completion.

Shipping Board's Bristol Plant (85584 A). Ills. 2200 w. Int Mar Eng—April, 1918. Shipyard and industrial town.

Shipyard of the Sun Shipbuilding Company (85586 A). Ills. 2000 w. Int Mar Eng—April, 1918. Splendidly ar-

Shipyards

ranged and equipped plant at Chester, Pa., for building standard types of oil tankers and steel cargo vessels.

The Hog Island Ship Yard (85354). Ills. 3000 w. Ry Rev—March 30, 1918. History of the development, etc.

The Shooters Island Shipyard (85,587 A). Ills. 1500 w. Int Mar Eng—April, 1918. Reconstructed plant of the Standard Shipbuilding Corporation.

Capital Now Flows to Shipyards (83993 B). Guy F. Creveling. Ills. 2500 w. Mar Rev—Feb., 1918. Shipbuilding in America. Future financial support assured.

New Shipyards Built on Canadian Pacific Coast (84392). R. Mackay Fripp. Ills. 1200 w. Eng News-Rec—Feb. 21, 1918. Types of plants for both wooden and steel vessels in British Columbia.

Tremendous Cost of Hog Island Plant (84111 A). 2500 w. Iron Age—Feb. 7, 1918. Critical discussion of the new shipyards of the U. S. Government.

Look Shipyard Problems in the Face (89133 A). 600 w. Ind Man—Oct., 1918. Editorial criticism of the management of the yards.

Report of the Shipyard Employment Managers' Conference (83644 N). 60 pp. U S Gov Print Office—1918. Report of conference held under the auspices of the industrial service department of the division of construction.

Three Government Shipyards Huge Problem in Plant Layout (83450). Ills. 5500 w. Eng News-Rec—Jan. 3, 1918. Design of government plants for building fabricated steel ships.

Shipyard of Columbia Engineering Works (86110 A). Ills. 1500 w. Int Mar Eng—May, 1918. Plant at Portland, Ore., for building wooden ships.

Facts About the Hog Island Yard (84624 A). George J. Baldwin. 2500 w. Mar Rev—March, 1918. Address by Chairman of Am. International Shipbuilding Corporation before Phila. Chamber of Commerce.

Hydraulic Equipment of a Modern Shipyard (86599). J. H. Rodgers. Ills. 2500 w. Mar Eng, Can—May, 1918. Modern practice in a fully equipped plant.

A New California Shipyard (89562 A). W. W. Hanscom. Ills. 4500 w. Met Trds—Oct., 1918. Plant of the Pacific Coast Shipbuilding Co. at Bay Point.

Marine De Commerce a Vapeur (89,720 B). E. Bertin. Ills. 4000 w. La Nature—Oct. 5, 1918. Post-war problems in steam navigation. Japanese shipyards.

State Control**Shipyard Sanitation**

Design and Construction of Water and Sewerage Works at the Hog Island Shipyard (88006 A). W. H. Blood, Jr. Ills. 1700 w. Mun Eng—Aug., 1918. Detailed description; difficulties, etc., at this great establishment.

Shops

Man-O-War's Repair Shop is Unique (85927 A). Ills. 600 w. Mar Rev—May, 1918. Features of a modern battleship machine shop.

Signalling

Synchronous Signalling and Safety at Sea (86216 A). Abstracts of lectures by J. Joly, before the Royal Instn. 2000 w. Engr—Apr. 19, 1918. Considers additional aids to navigation to escape dangers from failure of aerial fog signals. Recent developments in methods of signalling.

Smoke

How Can Soft Coal Be Burned Without Smoke in Marine Boilers? (88054 A). 1800 w. Int Mar Eng—Aug., 1918. Mechanical stoking and use of pulverized coal advocated. Details of equipment required.

Smoke Screens

The Yarrow Anti-Submarine Smoke System (89339 A). Ills. 800 w. Engr—Sept. 13, 1918. Describes method of eliminating smoke column. Now in active use on merchant ships.

Spanish Navy

Spanish Navy Construction (87347 A). Ills. 1500 w. Engr—May 31, 1918. Recent development in Spanish shipbuilding.

Stabilizers

See same heading under Mechanical Engineering, Aeronautics.

Stability

The Effect of the Longitudinal Motion of a Ship on its Static Transverse Stability (86581 N). G. S. Baker and Miss E. M. Keary. Ills. 2500 w. Instn Nav Archts—Mar. 21, 1918. Experimental investigations and results.

Standardization

Marine Engineers Discuss Standardization (84045). Ills. 2500 w. Auto Ind—Jan. 31, 1918. Considers standardize fittings and construction of one-design vessels.

Standard Oil

Standard Oil's Losses (87642). 2000 w. Naut Gaz—July 20, 1918. The tankers have many battles with German U-boats.

State Control

See same heading under Industrial Management, Regulation.

Terminals

Steaming Data

Convenient Method of Handling Steaming Data (85316 A). Jules James. 2000 w. U S Nav Inst, Pro—March, 1918. Set of curves, explaining their use.

Steamships

Five Thousand-Ton Deadweight Fabricated Steel Cargo Steamer for Emergency Fleet (85588 A). Ills. 5000 w. Int Mar Eng—April, 1918. Details of vessel being built at Newark Bay plant.

Steam Traps

Steam Traps in the Naval Service (86926 F). F. G. Hechler. Ills. 15 pp. Am Soc Nav Engrs, JI—May, 1918. Classification, operation, capacity, types, etc.

Steam Winch

Power of a Steam Winch (86210 A). S. H. Cornell. Ills. 1000 w. Am Soc Mar Dftn, JI—Jan., 1918. Analysis.

Steel Ships

Cast Steel Ship Construction (85-133). Ills. 1200 w. Naut Gaz—Feb. 7, 1918. Cast steel and welded steel.

Steering

Notes on Steering Gears, Rudders, Torque, and Steering Engine Performance (83169 A). Lucian E. Underwood. Ills. 3500 w. Am Soc Mar Dftn, JI—Oct., 1917. Methods of control and operation.

Storage Batteries

Floating the Storage Battery on the Line (88176 A). Lucius C. Dunn. Ills. 24 pp. U S Nav Inst, Pro—July, 1918. Deals with application to submarines.

Sull' Impiego Degli Accumulatori (87101 C + D). G. Ferretti. Ills. 2800 w. Rivista Marittima—Jan.-Feb., 1918. Methods of charging storage batteries on submarines. Calculation of generating sets, etc.

Submarine Chasers

Manufacturing Eagles at Ford Shipyard (88935 A). Charles Lundberg. Ills. 2500 w. Iron Age—Sept. 19, 1918. Details of plant and methods used.

Submarine Chasers

Italian Submarine Chasers (83761 A). Ills. 300 w. Engr—Dec. 28, 1917.

Submarines

Campagne des Sous-Marins Contre Le Marine De Commerce (85888 B). E. Bertin. Ills. 6300 w. La Nature—Mar. 30, 1918. Submarine warfare and means of protecting merchant ships.

Offensive Against the Submarine (84326 A). Joseph A. Steinmetz. Ills. 5000 w. E Cb Phila, JI—Feb., 1918. Protection against submarine attack; mines and torpedoes for naval operations, etc.

La Défense Du Commerce Maritime (83946 B). 4700 w. Le Génie Civil—Dec. 15, 1917. Serial, 1st part. Progress in defense of the merchant marine.

Une Demi-Année De Guerre Sous-Marine (83900 B). Ills. 2300 w. La Nature—Nov. 17, 1917. Charted records of sinkings, unsuccessful attacks and losses of both neutrals and allies.

The Work of British Submarines (86249 A). 1600 w. Engr—Apr. 26, 1918. Editorial on submarines of the Allies and especially the work of the British during the war.

The Submarine and Kindred Problems (82288 A). 3000 w. Engr—Oct. 19, 1917. From circular issued by U. S. Naval Consulting Board pointing out certain principles misunderstood by laymen.

The Submarine (82927 A). C. H. Bedell. Ills. 28 pp. A S M E—Dec., 1917. History, development, equipment, etc.

Le Navi Ausiliarie Sommergeibili Nelle Marine Da Guerra (87107 B). C. Zecchini. Ills. 3300 w. Industria—Apr. 30, 1918. Design for a cargo carrying submarine.

La Lutte Contre Les Sous-Marins Et Les Inventeurs (85121 B). H. Volta. Ills. 4200 w. La Nature—Feb. 23, 1918. Devices for intercepting and destroying submarines. Recent inventions.

Eight Months of U-Boat Warfare (84739 A). Leonard M. Passano. 1500 w. Int Mar Eng—March, 1918. Evasion proves best defense against submarines.

Offensive Against the Submarine (84642 A). Joseph A. Steinmetz. 4500 w. A S M E, JI—March, 1918. With annotations to the suggestions to inventors made by the U. S. Naval Consulting Board regarding the submarine and kindred problems.

Silver Linings to the Submarine Piracy (84744). George S. Laing. 2500 w. Mar Eng, Can—Jan., 1918. Lessons that have been learned from submarine warfare.

La Protection Des Navires Contre Les Sous-Marins (85253). H. Volta. Ills. 3200 w. La Nature—March 9, 1918. Protection against U boats. Camouflage, smoke screens and suggested devices of various kinds.

Terminals

Concrete in Marine Terminals (85-595 A). H. Colin Campbell. Ills. 3000 w. Int Mar Eng—April, 1918. Various uses to which it is applied.

Tonnage

Marine Terminal Engineering (85-596 A). H. M. Harding. 3500 w. Int Mar Eng—April, 1918. Lecture at Sheffield Scientific School. Terminal facilities; arrangements; fireproofing, etc.

Transportation Efficiency for the War (84094 A). E. Amberg. Ills. 1500 w. Int Mar Eng—Feb., 1918. Development of terminal facilities. What New Orleans has accomplished.

Post Terminals for War Transportation Being Built (84796). Ills. 1700 w. Eng News-Rec—March 7, 1918. Details of increased facilities being provided.

Tonnage

What Is Ship Tonnage? (88343). S. M. Meeker, Jr. 1000 w. Can Engr—Aug. 22, 1918. Explanatory.

Torpedo Attacks

Moving Targets and Torpedo Attack (87892 A). 4000 w. Engr—June 28, 1918. Serial, 1st part. Construction and operation of torpedoes.

Torpedoes

Early History of the Marine Torpedo (88633 A). H. H. Manchester. Ills. 2000 w. Am Mach—Sept. 5, 1918. The prototype of the torpedo described.

Les Modèles Actuels De Torpilles Automobiles (83943 B). M. Stroh. Ills. 6200 w. Le Génie Civil—Dec. 8, 1917. Interior mechanism and apparatus of several types of torpedo.

Torpedo Explosions

Effect of Torpedo Explosions on the Structure of Merchant Ships (86106 A). 1200 w. Int Mar Eng—May, 1918. Report of committee of Instn. Nav. Archts. on cargo ships and mail and passenger vessels.

Training

Training Shipyard Workers by Emergency Fleet Corporation Methods (86687 A). R. V. Rickcord. Ills. 2500 w. Int Mar Eng—June, 1918. Carefully selected mechanics taught by skilled instructors.

Manning the New Merchant Marine (86587 A). Henry Howard. Ills. 3000 w. Mar Rev—June, 1918. How the U. S. Shipping Board is training officers and crews for the new American ships.

Turning Radius

La Legge Di Similitudine—Delle Qualita Evolutive Delle Navi (85850 C + D). N. Pecoraro. Ills. 4400 w. Rivista Marittima—Nov., 1917. A study of the facility for turning. Results obtained with an experimental ship.

Turbines

2,500 H. P. Rateau Marine Geared Turbines (88136 A). Ills. 2000 w.

Valve Gears

Engr—July 12, 1918. Detailed description of turbine built by the British Westinghouse Co.

Turbines and Reduction Gears in the Merchant Marine (87946 A). J. A. Davies. Ills. 2000 w. Elec J1—Aug., 1918. Propelling machinery built by the Westinghouse Machine Co.

United States

Greatest Maritime Nation of World Is Position United States Will Take (85313). Edward N. Hurley. Extracts from speech before Natl. Marine League, at Delmonico's, in New York. 2500 w. Mfrs Rec—March 28, 1918. Analysis of the shipbuilding situation.

U. S. Navy

Electricity as Applied in the U. S. Navy (84366). Ills. 3000 w. Power—Feb. 19, 1918. Various electrical appliances on a modern battleship.

The Navy and Its Health Problems (82624 B). William C. Braisted. 3000 w. Am J1 Pub Hh—Nov., 1917. Reviews the improvements in hygienic conditions and the results, and needs yet unaccomplished.

The New American Naval Programme (82559 A). 2500 w. Engr—Nov. 2, 1917. Discusses the elements of American designs and equipment.

U. S. Shipping Board

U. S. Shipping Board: Its Handicaps and Accomplishments (86098). Edward N. Hurley. Ills. 2500 w. Mar Eng, Can—April, 1918. Address before Nat. Marine League, New York.

Unloading

A New and Novel System of Vessel Unloading (82869). Ills. 1500 w. Ry Age Gaz—Dec. 7, 1917. Automatic car loading machine with electric weighing devices on an open pier.

Unsinkable

Unsinkable Freight Ship of French Design (89316 A). Ills. 500 w. Int Mar Eng—Oct., 1918. Design of M. La Parentier. Five steel cargo steamers of the type are under construction.

Unsinkable Ship

Unsinkable Cargo Vessel (85875). 2600 w. Naut Gaz—Apr. 4, 1918. Isherwood system of design to secure greatest floatability after being torpedoed.

Unsinkable Ship Plans (85250). 1000 w. Naut Gaz—March 7, 1918. Consideration of various plans that have been proposed. Opinions of experts on the Donnelly and the Niles plans.

Valve Gears

Balance Cylinders vs. Lovekin Assistant Cylinders for Valve Gears (83-

Valves

171 A). O. J. Peterson. Ills. 1000 w. Am Soc Mar Dftn J1—Oct., 1917. Comparison of the performances.

Valves

Safety and Relief Valves (85585 A). M. W. Link. Ills. 2000 w. Int Mar Eng—April, 1918. Serial, 1st part. Construction and operation of valves for marine work.

Vent Pipes

Determining the Size of Air Escape or Vent Pipes (83170 A). Samuel B. Crosby. 800 w. Am Soc Mar Dftn, J1—Oct., 1917. Outlines method.

Wooden Ships

The Wooden Ship—The South's Contribution to the New American Merchant Marine (89634). E. T. Hollingworth, Jr. 1800 w. Mfrs' Rec—Oct. 17, 1918. Account of the work that has been accomplished and the outlook.

West Coast Leads in Wooden Ships (89143 A). A. Mobley Sutton. Ills. 1800 w. Mar Rev—Oct., 1918. Account of work accomplished in the shipyards of Oregon and Washington.

Wooden Vessels

New Type Wooden Ship (85251). 1800 w. Ills. Naut Gaz—March 7, 1918. The "War Mystery," largest wooden steamship ever built, launched recently.

Build More Wooden Ships (86107 A). H. J. Roundy. 2500 w. Int Mar Eng—May, 1918. Plea for continuation of wooden shipbuilding.

How Wooden Ships Are Laid Off (85930 A). Samuel J. P. Thearle. Ills. 4000 w. Mar Rev—May, 1918. Serial, 1st part. Application of geometry to wooden shipbuilding.

Wooden Vessels

Revival of Wooden Ships (87983). 2200 w. Naut Gaz—Aug. 3, 1918. Emergency vessels.

Anyox—A New Wooden Ore Carrier (83404 A). Robert C. Hill. Ills. 2000 w. Mar Rev—Jan., 1918. Details of a recently completed steamer.

Largest Wooden Vessel Launched (85594 A). Ills. 1200 w. Int Mar Eng—April, 1918. Details of the "War Mystery" under construction in Texas.

MECHANICAL ENGINEERING

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AERONAUTICS

Aeroplanes

Aerial Mail

The Dispatch Board Invented by Captain Benjamin B. Lipsner, Chief of the Aerial Mail Division, Post Office (88658). Ills. 700 w. A A Wkly—Sept. 9, 1918. Detailed description.

Aerial Photography

Making War Maps by Camera (88981). Ills. 700 w. Auto Ind—Sept. 19, 1918. Aerial photography in military operations.

Aerial Propellers

Theory and Operation of Dr. Zahm's Propeller Computer (82981 B). W. P. Loos. Ills. 700 w. Fkn Inst, J1—Dec., 1917. Theory and construction.

Aeronautic Maps

Aeronautic Maps and Aerial Transportation (82351 A). Henry Woodhouse. Ills. 10 pp. Flying—Nov., 1917. Types, and air traffic, with topics related.

Aerodynamic Laboratory

The Aerodynamic Laboratory at Leeland Stanford Junior University and the Equipment Installed with Special References to Tests on Air Propellers (84448). William F. Durrand. Ills. 2500 w. A A Wkly—Feb. 25, 1918. Serial. 1st part.

Aeronautical Problems

Some Outstanding Problems in Aeronautics (88514). W. F. Durand. 4000 w. Auto Ind—Aug. 29, 1918. Serial, 1st part. Sixth Wilbur Wright lecture in London. Problems of material, size limits, variable wiring area and camber.

Aeronautical Problems

Aeronautical Problems Elucidated by Lessons from Paradoxical Windwheels (86879 A). Thomas O. Perry, with note

by W. F. Gerhardt. 12 pp. Mich Tech—May, 1918. Experiments described.

Aeroplanes

Some Outstanding Problems in Aeronautics (87766 A). Dr. Durand. 2500 w. Engng—June 28, 1918. Serial, 1st part. Slightly abridged paper, read before the Aeronautical Soc. of Gt. Britain. Constructive materials, size, design, motive power, fuel, etc., are discussed.

L'Évolution De L'Aviation Allemande (85871 B). J. A. Lefranc. Ill. 5600 w. La Nature—March 16, 1918. Comprehensive review of different German motors.

The Use of Spruce in Aeroplane Construction (85367). J. A. Newlin. 1200 w. A A Wkly—April 1, 1918. Data obtained by the Forest Products Laboratory.

Aeroplane Limits (82556 A). 1000 w. Engng—Nov. 2, 1917. Limit of the useful load.

The Roland Single Seater Fighter (88264). Ills. 1200 w. Auto Ind—Aug. 15, 1918. Mechanical details.

The Armament of Aeroplanes (83063 A). Ills. 1500 w. Engng—Nov. 23, 1917. Reviews types adopted on different aeroplanes.

The S. V. A. Fighting Scout (82757). Ills. 1200 w. A A Wkly—Dec. 3, 1917. Detailed description of these machines, built in Genoa.

Aeroplani Velocissimi (83300 C+D). A. Guidoni. Ills. 2200 w. Rivista Marittima—Sept., 1917. High-speed aeroplanes. Calculation and curves showing ratio of horsepower and speed.

Consult Classification of the Index. See page 9.

Aircraft

AERONAUTICS

Aircraft

Aeroplane Construction in General (83493). Ottorino Pomilio. Ills. 2200 w. A A Wkly—Jan. 7, 1918. Serial, 1st part. Types and their construction.

Exploring and Mapping Jungle Lands by Aeroplane (83553 A). Russell Hastings Millward. Ills. 2200 w. Flying—Jan., 1918. Work of aviators after the war.

Some Notes on Recent German Aeroplanes (83389 A). Ills. 2000 w. Engr—Dec. 14, 1917. Information regarding certain types of captured machines exhibited in England.

Aerostatics

Military Aerostatics (88111). H. K. Black. Ills. 700 w. A A Wkly—Aug. 12, 1918. Serial, 1st part. Balloons.

Aircraft

L'Évolution De L'Aviation Allemande (85116 B). J. A. Lefranc. Ills. 4000 w. La Nature—Feb. 9, 1918. Development of aviation in Germany. First part, air planes.

On the Maximum Flight Value of Aeroplanes (84805). Umberto Nobile. 2500 w. A A Wkly—March 11, 1918. A study.

Wing Bracing and Head Resistance (85215). Marco Polo. Ills. 1200 w. A A Wkly—March 23, 1918. Progress made.

Calculation of Stresses in Aeroplanes (86341). S. E. Slocum. 2000 w. A A Wkly—May 20, 1918. Serial, 1st part. Aims to explain as simply as possible the four main items involved in the design of aeroplanes.

German Aeroplane Design (86484). 1300 w. Times Engng Supp—April 26, 1918. Construction and details of the Fokker triplane and a bombing plane.

Stability of Aeroplanes (86368 A). H. A. Webb. 800 w. Engng—May 3, 1918. Aims to give a simple proof of the fundamental equations of stability.

Starting, Landing and Piloting Large Aeroplanes (86076 A). Silvio Resnati. Ills. 1000 w. Flying—May, 1918. Considers a 5,000 hp. air-cruiser a near possibility. Its manipulation discussed.

The Friedrichshafen Bombing Aeroplane (86248 A). 800 w. Engr—April 26, 1918. Serial, 1st part. Information concerning the design and construction from a report by the Aircraft Production Department of the Ministry of Munitions.

The Berckmans Speed Scout (85-983). George F. McLaughlin. Ills. 800 w. A A Wkly—April 29, 1918. Detailed description. Quick climbing ability one of the inherent features of its design.

The Use of Jigs, Fixtures, Gauges, and Tools in Aeroplane Manufacture (86075). R. Borlase Matthews. Ills. 3500 w. A A Wkly—May 6, 1918. Serial, 1st part. Substance of a lecture delivered at Roy. Soc. of Arts, London.

Woodworking Machinery in Aeroplane Construction (86339). Ills. 3000 w. A A Wkly—May 20, 1918. Details of the construction of the machine.

Co-operation Between Balloons and Artillery (82218). D. Rainsford Hannay. Ills. 1500 w. A A Wkly—Nov. 5, 1917. Describes working of a balloon section of the British Army in the field.

Firing at Captive Balloons and Proposed Aids in the Direction of Fire Against Aircraft (82467). Allan Cyrus. 2000 w. A A Wkly—Nov. 19, 1917. Construction and use of the computing stick.

International Aircraft Standards (87484 B). Charles M. Manly. 3000 w. S A E, JI—July, 1918. Present status of standardization work on materials and methods.

Report on Aircraft Supply of Great Britain and Discussion of the Difficulties Involved in Production (87332). 1500 w. A A Wkly—July 8, 1918. Extract from 1917 report of the War Cabinet of Gt. Britain. Difficulties in the way of obtaining a supply of aircraft.

Products of the Royal Aircraft Factory (88097). Ills. 1000 w. Auto Ind—Aug. 8, 1918. Models developed at the establishment of the British government.

Military Aircraft and Their Armament (84715). Jean Abel Lefrance. Ills. 3000 w. A A Wkly—March 4, 1918. Technical elements to be considered.

Felt in Aircraft Construction (82466). S. W. Widney. 1800 w. A A Wkly—Nov. 19, 1917. Uses of felt; different grades, etc.

Commercial Aeronautics (83090 A). Mervyn O'Gorman, with discussion. 9000 w. Roy Soc Arts, JI—Dec. 7, 1917. Aerial transport and travel considered.

Commercial Airplanes in Near Future (83123). W. B. Stout. Ills. 300 w. Auto Ind—Dec. 20, 1917. Read before S A E. The outlook, safety, etc.

International Aircraft Standards (82-758). Ills. 4500 w. A A Wkly—Dec. 3, 1917. Serial, 1st part. Specifications adopted by the International Aircraft Standards Board.

The Aircraft-Problem (83332 A). W. F. Durand. 4000 w. A S M E, JI—Jan., 1918. Problems in forming and maintaining a large and efficient air fleet.

Aircraft**AERONAUTICS****Airplanes**

The Amazing Development of Military Aeronautics in 1917 (83571). Henry Woodhouse. Ills. 2000 w. A A Wkly—Jan. 14, 1918. The importance of the air service.

Commercial Future of Aircraft (84551 B). William B. Stout. Ills. 2500 w. S A E, J1—Feb., 1918. Fundamentals regarding the work and changes expected.

International Aircraft Standards Adopted by the International Aircraft Standards Board (84449). 4000 w. A A Wkly Feb. 25, 1918. Specifications.

Metals Used in the Construction of Aircraft (84086). Charles Vickers. 2500 w. Fndry—Feb., 1918. Importance of cast iron, semi-steel, aluminum, brass and bronze in the building of airplanes.

Aircraft Board Reorganized by President (86534). 2000 w. Auto Ind—May 23, 1918. The President's order reorganizing aircraft activities.

Aircraft Mechanics

Tools and Fixtures for Aircraft Mechanics (85169). B. Z. Reiter. Ills. 900 w. Am Mach—March 14, 1918. Details of a number of useful tools for airplane work.

Air Fighting

Tricks Necessary in Air Fighting (85397 A). Granville A. Pollock. Ills. 2500 w. Flying—April, 1918. Tricks that save a pilot and tricks that kill him.

Aircraft Investigation

Offered Aid of Allies Not Accepted by Aircraft Authorities (88807). Allen Sinsheimer. 1800 w. Auto Ind—Sept. 12, 1918. Suggested subjects for a real aircraft investigation.

Complete Text of Senate Aircraft Report (88515). 7 pp. Auto Ind—Aug. 29, 1918. Text of report of the sub-committee on Military Affairs, appointed to investigate aircraft invention in the United States.

Tricks and Acrobatics in Air Fighting (89624). From *Sci Am*. Ills. 1400 w. Com Air Mag—Oct., 1918. Describes in detail stunts useful in aerial combat.

Airplane Cylinder

Manufacturing the Curtiss Airplane Cylinder (86404). G. D. Ranger. Ills. 1200 w. Am Mach—May 23, 1918. Covers operations in their sequence.

Airplane Delays

Airplane Delays Due to Lack of Co-operation and Experience (88510). David Beecroft. 4000 w. Auto Ind—Aug. 29, 1918. Explains reasons for delay.

Airplane Details

Strut Sockets and Other Sheet-Metal Airplane Fittings (88079 A). Fred H.

Colvin. Ills. 1000 w. Am Mach—Aug. 8, 1918. Details of operations on several complicated pieces.

A New Method for the Testing of Airplane Wing Ribs (87816). Irving H. Cowdrey. Ills. 4000 w. Auto Ind—July 25, 1918. Describes apparatus employed.

Air Pilots

Scientific Tests For The Selection Of Pilots For The Air Force (87113 A). M. Flack. 1100 w. Nature—May 23, 1918. Outline of usual requirements and means of meeting them.

Airplanes

Airplane Performance Determined by Engine Performance (89310 B). G. B. Upton. 3500 w. S A E, J1—Oct., 1918. Shows the general nature and approximate numerical value of the effects of altitude on the performance of airplanes and airplane engines.

The Theoretical Basis of Model Strength Tests for Aeroplane Structures (89603). W. L. Cowley and H. Levy. 3000 w. A A Wkly—Oct. 21, 1918. Application of the principle of homogeneity of dimensions to the problem.

Airplanes of To-day (87047). Fay Leone Faurote. 3500 w. Auto Ind—June 20, 1918. Reviews the history of heavier-than-air machines.

Quantity Versus Quality in Airplane Combat (87052). J. G. Coffin and H. T. Booth. 2000 w. Auto Ind—June 20, 1918. Numerical superiority the controlling factor even when superiority of quality is on the other side.

The Austrian Berg Single-Seater Fighter (87071). Ills. 1000 w. A A Wkly—June 24, 1918. Detailed design.

Metal Frames and Fittings for Airplanes (83098). Fred H. Colvin. Ills. 1000 w. Am Mach—Dec. 20, 1917. Ways in which metal is supplanting wood.

Problems in Airplane Production (83172 B). W. F. Durand. 2200 w. S A E, J1—Dec., 1917. Questions that arose for immediate consideration and the general character of the answers.

Some Recollections of the Langley Airplane (82852). An interview with Charles M. Manly. 1800 w. Am Mach—Dec. 6, 1917. Early experiments and their bearing on development.

The Technical History of the Airplane (84046). F. M. Green. Ills. 4500 w. Auto Ind—Jan. 31, 1918. How the various elements have been developed.

Types of Military Airplanes (84034 B). V. E. Clark. 1800 w. S A E, J1—Jan., 1918. Types as influenced by the military

Air Propellers

functions and as influencing the design of the engine.

Women in Airplane Production (84096). J. William Chubb. Ills. 1800 w. Am Mach—Feb. 7, 1918. In Great Britain women are successfully filling positions of skilled mechanics.

Air Propellers

Air Propeller Performance and Design by the Specific-Speed Method (86929 F). M. C. Stuart. 18 pp. Am Soc Nav Engrs, JI—May, 1918. New method of treatment of the performance and design of geometrically similar air propellers.

Airscrew

Notes on Airscrew Analysis (88361). M. A. S. Riach. 3000 w. A A Wkly—Aug. 26, 1918. Investigations.

Some Notes on the Airscrew and the Problem of Optimum Diameter (83152). E. P. King. Ills. 2000 w. A A Wkly—Dec. 24, 1917. Shows methods of determination which may be employed.

Air Service

America's Air Service (83881 B). W. F. Durand. Ills. 26 pp. Fkn Inst, JI—Jan., 1918. Account of the purposes of such a war measure and the requirements.

The War in the Air (83602 A). G. Douglas Wardrop. 2500 w. E Cb, Phila, JI—Jan., 1918. What the Germans have accomplished and the problems to be solved.

Anti-Aircraft

Il Problema Del Tiro Antiaereo (85873 C+D). G. Fioravanzo. 10,400 w. Rivista Marittima—Dec., 1917. Considerations governing the problem of anti-aircraft gun fire.

Formole Per Le Traiettorie Antiaeree (84575 C + D). G. Manetti. 2200 w. Rivista Marittima—Oct., 1917. Mathematical treatment of trajectory of anti-aircraft projectiles.

Automotives

Automotives in the Great War (83790). Coker F. Clarkson. 3500 w. Am Mach—Jan., 24, 1918. Reviews the accomplishments during the past year.

Aviation

Some Fundamentals of Aviation (87773 A). William B. Stout. 2200 w. E Cb Phila, JI—July, 1918. Engines and performance of aeroplanes.

Les Nouveaux Types D'Avions Allemands (87712 B). Ills. 3300 w. Génie Civil—June 15, 1918. New types of German and Austrian machines now in use.

Italian War Aviation (88539). Giuseppe Bevione. Ills. 1500 w. A A Wkly—Sept. 2, 1918. Urging assistance in materials from America.

AERONAUTICS**Biplane**

Organization of the German Army Aviation Service (88095). Ills. 1200 w. Auto Ind—Aug. 8, 1918. Four classes for bombing and reconnaissance.

The Present State of the German Aviation Programme (87825). E. H. Sherbondy. 1500 w. A A Wkly—July 29, 1918. Types of planes, armament, and other information.

Trois Ans D'Expériences Sur L'Aéroplane (84593 C + D). M. J. Legrand. Ills. 11000 w. Bul Soc D'Encouragement Pour L'Industrie Nationale—Sept.-Oct., 1917. Progress in aeroplane construction during last three years.

La Liason Aérienne Et La T. S. F. En Avion (83932 B). J. A. Lefranc. Ills. 2900 w. La Nature—Dec. 8, 1917. Aviation and radio operations by the Germans. Types of planes used, radio apparatus and fire control.

Aviation Motors

Carburants and Lubricants for Aviation (84803). Umberto Pomilio. Ills. 2000 w. A A Wkly—March 11, 1918. A study of these substances with analysis and control of their requisites. Results obtained in service.

Aviators

Fighting Efficiency of American Aviators Can Be Quadrupled by Adoption of Walter Camp's Method of Training (83552 A). Henry Woodhouse. Ills. 1500 w. Flying—Jan., 1918. Value of training.

The Aviator, the Quarterback of War's Gridiron (83551 A). Walter Camp. Ills. 1800 w. Flying—Jan., 1918. Training to keep him in the physical, mental and nervous condition.

Ballooning

Free Ballooning (83554 A). F. P. Lahm. Ills. 1500 w. Flying—Jan., 1918. The care, equipment, management and usefulness.

Biplane

The Albatros Type "CV" Fighter (85482). Ills. 2000 w. A A Wkly—April 8, 1918. Serial. 1st part. Interesting features.

The C. IV. Rumpler Biplane (85366). Ills. 1000 w. A A Wkly—April 1, 1918. A general utility enemy machine of great speed.

The A. E. G. Armored Biplane (89335 A). Ills. 1500 w. Engr—Sept. 6, 1918. Designed for carrying out offensive patrols against infantry. Leading particulars and detailed description.

The Hannoveraner Biplane (89341 A). Ills. 2000 w. Engr—Sept. 13, 1918. Details of this German machine.

The Rumpler Two-Seater Biplane (89538 A). Ills. 2000 w. Engr—Sept.

Bombing**AERONAUTICS****Design**

20, 1918. Information concerning its construction and performance.

The De Haviland IV Biplane (87978). Ills. 2000 w. Auto Ind—Aug. 1, 1918. Details of British long-distance reconnaissance and bomb-dropping machine.

The German H. W. Biplane (88112). Ills. 1200 w. A A Wkly—Aug. 12, 1918. Interesting features of the Hannover.

Friedrichshafen Bombing Plane (87367). 700 w. Auto Ind—July 4, 1918. Details of one of the latest designs of German long range bombers.

The A. E. G. Bombing Biplane (87349 A). Ills. 4000 w. Engr—June 7, 1918. Notes on the capabilities and construction of the latest German aeroplane.

The English S. E. V. A. Single-Seater Fighter (87333). Ills. 1000 w. A A Wkly—July 8, 1918. Detailed description.

The Friedrichshafen Bombing Biplane (86766). Ills. 3000 w. A A Wkly—June 10, 1918. Serial, 1st part. A report issued by the technical department of the Department of Aircraft Production, British Ministry of Munitions.

The Lawson M. T. 2 Tractor Biplane (86647). Ills. 1200 w. A A Wkly—June 3, 1918. Characteristics and recent improvements.

The Spad Two-Seater Biplane (87053). Ills. 1200 w. Auto Ind—June 20, 1918. Strut arrangement different from single-seater; dual control, etc.

The Fokker Biplane (88966). G. Douglas Wardrop. Ills. 1700 w. A A Wkly—Sept. 23, 1918. Fokker biplane of the D VII type shown at the London Enemy Aircraft Exhibit.

The German Ago Fighting Biplane (83573). Ills. 3300 w. A A Wkly—Jan. 14, 1918. Detailed description.

The German A. E. G. Bombing Biplane (83492). Ills. 1800 w. A A Wkly—Jan. 7, 1918. Particulars of the 1917 type.

The Albatross Fighting Biplane (86536). Ills. 1400 w. Auto Ind—May 23, 1918. Serial, 1st part. Detailed description of one of the best known German fighting machines.

The Friedrichshafen 450 H.P. Gotha II Fighting and Bombing Biplane (86340). Ills. 1000 w. A A Wkly—May 20, 1918. Detailed description.

The Continental Pusher Biplane (83258). Ills. 800 w. A A Wkly—Dec. 31, 1917. Specifications and description of a successful type.

Bombing

"Laying the Egg on the Hun" (88096). Ills. 1500 w. Auto Ind—Aug.

8, 1918. The training of a bomber.

The Problems of Aerial Bombing (88336). Ills. 2000 w. Auto Ind—Aug. 22, 1918. Details of bombs, bombing and bomb carrying.

The Problem of Defeating Germany and How It Can Be Accomplished (84220 A). Norman H. Read. Ills. 4000 w. Flying—Feb., 1918. Urges construction of great fleets of super-bombing machines, able to fly across the Atlantic.

Bombing Planes

Delay in Bombing Planes for War Program (88694). 3000 w. Auto Ind—Sept. 5, 1918. Story of failure of Bristol fighter.

British Machine

The S. E. 5A Single Seater Fighter (88334). Ills. 1000 w. Auto Ind—Aug. 22, 1918. Mechanical details of British machine which has been adopted by U. S. army authorities.

British Policy

Points in British Air Policy (85485). 5500 w. Auto Ind—April 4, 1918. Requirements to maintain efficiency.

Castor Oil

How Castor Oil Produced in the South May Save the Nation (84153). Howard L. Clark. 1200 w. Mfrs Rec—Feb. 7, 1918. The only oil to meet the requirements of aviation engines. The South to plant 200,000 acres with castor beans.

Classification

System of Classification for Aeronautical Information (87055). Fay L. Faurote. Ills. 3000 w. Auto Ind—June 20, 1918. Simple arrangement for filing data for quick reference.

De Haviland

The De Haviland V. Single Seater (88967). Ills. 1200 w. A A Wkly—Sept. 23, 1918. Description from a technical German aero paper.

The 300 Horse-Power Maybach Aero-Engine (89045 A). Ills. 2500 w. Engr—Aug. 30, 1918. Serial, 1st part. Information and particulars concerning this new design.

The 240 H. P. 8-Cylinder Mercedes (88538). Ills. 1000 w. A A Wkly—Sept. 2, 1918. Serial, 1st part. Detailed report on the design of this engine based on an investigation of the engine taken from the German two-seater Albatros biplane.

Design

Aeroplane Design (88424). W. F. Durand. 2500 w. Times Engng Supp—July, 1918. Problems discussed in lecture at British Aeronautical Society.

Official Guide for Airplane Inventors (88266). 2200 w. Auto Ind—Aug. 15, 1918. Possibilities for inventions and improvements in aircraft design as

Dirigibles

stated by Naval Consulting Board and the War Committee of Technical Societies.

The Lateral Dihedral (87673). John G. Hanna. Ills. 4000 w. A A Wkly—July 22, 1918. Its elementary principles as applied to design, referring to W. R. D. Shaw's article.

Dirigibles

I Dirigibili Forlanini (85870 B). Ills. 4500 w. L'Industria—Feb. 28, 1918. New Italian dirigible embodying novel features.

Engines

The 300 H. P. Mayback Aero-Engine (89151 A). Ills & Plate. 3000 w. Engng—Aug. 30, 1918. Serial, 1st part. Particulars of the 300 h. p. engines fitted by the Germans to Rumpler biplanes.

The 180 Hp. Mercedes Aircraft Engine (88810). Ills. 2500 w. Auto Ind—Sept. 12, 1918. A development of the 160-hp. model having the same cylinder dimensions. Many details redesigned. Tests.

Engine Weight (85483). F. W. Lancaster, in Flying (London). 1500 w. A A Wkly—April 8, 1918. Gives diagram for comparing two engines and calls attention to results obtained.

Opposition to Liberty Engine Due to Interests in Other Types (85726). 2500 w. Auto Ind—April 18, 1918. Reports 264 liberty engines now in service.

Complete Inspection Procedure for Airplane Engines (87364). P. J. Piccirilli. 4000 w. Auto Ind—July 4, 1918. A list of things to be checked under each of the four heads of inspection.

The 180-H. P. Mercedes Aero Engine (87340 A). Ills. 3000 w. Engng—May 31, 1918. Report issued by the Ministry of Munitions. Constructional details and test.

Modern Aeronautic Engines (88044 B). Herbert Chase. Ills. 5 pp. S A E, JI—Aug., 1918. Serial, 1st part.

Developing the Hispano-Suiza Motor for the Air Service (88284). George H. Houston. Ills. 600 w. A A Wkly—Aug. 19, 1918. Story of the invention of this engine by a Swiss engineer.

The Mercedes 240 H. P. and 180 H. P. Aero Engines (86834 A). Ills. 1000 w. Engr—May 24, 1918. Serial, 1st part. Describes interesting features.

The Renault 400 Hp. Aircraft Engine (86735). Ills. 1500 w. Auto Ind—June 6, 1918. Used for bombing and combat planes.

The 240 H. P. (8 Cylinder) Mercedes (87072). Ills. 1200 w. A A Wkly—June 24, 1918. Detailed report on the design based on an investigation of the engine taken from the German two-seater

AERONAUTICS

Flying

Albatross Biplane, brought down in May, 1917.

The Benz 230-Hp. Aircraft Engine (84293). Ills. 1500 w. Auto Ind—Feb. 14, 1918. Serial, 1st part. Cast-iron cylinder and head castings in one piece and sheet steel jackets.

German Aeroplane Engines (83382 A). 1500 w. Engng—Dec. 14, 1917. Details of captured German aeroplanes and engines on exhibition at Islington, England.

British Aviation Engine Inspection (83562). R. K. Bagnall-Wild. Charts. 4000 w. Auto Ind—Jan. 10, 1918. Serial, 1st part. Chart scheme in use.

Overhauling the Gnome Airplane Engine (83348). Ills. 3500 w. Am Mach—Jan. 3, 1918. Instructions for disassembling and assembling.

The 160-Hp. Benz Aircraft Engine (83812 A). Ills. 1000 w. Auto Ind—Jan. 24, 1918. Design and performance data of one of Germany's leading aircraft engines.

The 320 H.P. Lancia Aeroplane Engine (83151). Ills. 1000 w. A A Wkly—Dec. 24, 1917. Detailed description.

Aviation Engine Development (82611). E. H. Sherbondy. Ills. 1800 w. A A Wkly—Nov. 26, 1917. Serial, 1st part. Reviews early development and difficulties of construction.

The 170 Horse Power Mercedes Aviation Motor (82217). E. H. Sherbondy. Ills. 2000 w. A A Wkly—Nov. 5, 1917. Details of one of the five types standardized by the German War Office.

The Engines of the Zeppelin and the Gotha (84846 A). Ills. 3500 w. Engr—Feb. 22, 1918. Serial, 1st part. Full particulars of the "Maybach" motor, and the "Mercédès" engine.

Flying

Acrobatic Flying (87074). Charles W. Keene. Ills. 1000 w. A A Wkly—June 24, 1918. Describes loops, tailspins, upside down glide, reverse loop, and other feats.

The Medical Aspect of Flying (87369 A). 2500 w. Flying—July, 1918. Experts explain the conditions to be met in flying, and the need of specially trained medical officers to ensure fit pilots for the service.

Present-Day Problems in Aeronautics (87244). W. B. Stout. Ills. 5000 w. A A Wkly—July 1, 1918. Read before the S. A. E. Problems of design and construction, and of landing.

Reminiscences of Early Flight (85918 B). E. W. Roberts. Ills. 3000 w. S A E, JI—April, 1918. Account of flight made

Flying Boats

with the Maxim steam-powered machine in 1894.

A Further Three Years' Flying Experience (82277 A). B. C. Hucks. Extract from paper before the Aeronautical Soc. of Gt. Britain. 6500 w. Roy Soc Arts, Jl—Oct. 19, 1917. Recent improvements; differences in machines; causes of crashes, training, etc.

Flying Boats

Austrian Ago and Lohner Flying Boats (83149). Ills. 900 w. A A Wkly—Dec. 24, 1917. Details of types named.

Flying Models

A Flash Steam Plant for Large Flying Models (84447). A. Koster. Ills. 300 w. A A Wkly—Feb. 18, 1918. Serial, 1st part. Compact and efficient power plant.

German Aviation

Évolution De L'Aviation Allemande (89718 B). J. A. Lefranc. Ills. 4800 w. La Nature—Sept. 21, 1918. Photographic apparatus employed by German aviators.

German Planes

German Aircraft (87730). 1000 w. Times Engng Supp—June, 1918. A new 180 h.p. Mercedes motor and a large bombing plane.

L'Évolution De L'Aviation Allemande (88429 B). J. A. Lefranc. Ills. 3100 w. La Nature—July 27, 1918. Fourth article on German machines. Controllers, instruments, respiratory apparatus, etc.

Évolution De L'Aviation Allemande (87125 B). J. A. Lefranc. Ills. 2700 w. La Nature—May 11, 1918. Third article on development of German aviation. Details of bombing equipment and electric circuits for fighting planes. Arrangement of guns, etc.

Guynemer

Captain Georges Guynemer, France's Greatest Ace (86596). W. F. Bradley. Ills. 3500 w. Auto Ind—May 30, 1918. Serial, 1st part. Life story of an aviator who had accounted for more than 100 enemy fliers.

High Altitudes

Problems in Flying at High Altitudes (88579 A). Augustus Post. 1000 w. Flying—Sept., 1918. Change in conditions due to reduced air pressure, influence on the aviator, etc.

Hydro-Aeroplanes

Il Problema Degli Idrovolanti (87102 C + D). A. Guidoni. Ills. 2000 w. Rivista Marittima—Mar., 1918. Recent examples of Italian and other hydro-aeroplanes. Motors, speed, manoeuvring ability and other characteristics.

AERONAUTICS**Hydrogen Plant**

A Suggested Type of Portable Hydrogen Plant (84309). Ills. 1000 w. A A Wkly—Feb. 18, 1918. Detailed description.

Hydroplanes

Curtiss Granted Flying Boat Patents (85481). Ills. 4000 w. A A Wkly—April 8, 1918. Specifications and claims.

Ignition

Airplane Motor-Ignition System (89589 A). B. Z. Reiter. Ills. 4500 w. Am Mach—Oct. 17, 1918. Systems are explained in detail.

Inclined Surfaces

The Influence of Aspect Ratio on the Critical Angle of Inclined Surfaces (83754 A). C. H. Powell. 500 w. Engng—Dec. 28, 1917. Investigations of value to aeroplane designers.

Italy

Plans and Accomplishments of the Italian Air Service (88267). Ills. 1800 w. Auto Ind—Aug. 15, 1918. Italy is supplying all its own needs in motors and planes, but must have American raw materials.

Laboratory

Aerodynamic Laboratory of the Leland Stanford Junior University (85381 B). William F. Durand. Ills. 4500 w. S A E, Jl—March, 1918. Taken from Part I. of Report No. 14 of the National Advisory Committee for Aeronautics, Washington. Experimental investigations.

Lafayette Escadrille

How the Famous Lafayette Escadrille Was Started (85398 A). Elliott C. Cowdin. Ills. 1500 w. Flying—April, 1918. Interesting account.

Liberty Engine

Reasons Behind the Liberty Aviation Engine (84035 B). Jesse G. Vincent, with discussion. 3000 w. S A E, Jl—Jan., 1918. Brief account of the designing.

Maps

Army Topographical Division Coordinates Work of Map Makers in Air and on Ground (86440). Robert K. Tomlin, Jr. Ills. 2500 w. Eng News-Rec—May 23, 1918. Existing French maps used as a basis for new work. Making relief maps.

Meteorology

Some Meteorological Conditions Which Increase the Danger of Flying (88824). C. J. P. Cave. Read before Aeronautical Soc. Ills. 3000 w. A A Wkly—Sept. 16, 1918. Serial, 1st part. Discusses gales, squalls; bumps and eddies; clouds, rain, hail and snow; fog and lightning.

Meteorology

AERONAUTICS

Sea Flying

Minimum Wage

The Minimum Wage (85882). 2200 w. Times Engng Supp—March 29, 1918. Discussion of the question, the ultimate aim, etc.

Model Experiments

The Wind Channel—Its Design and Use (83572). J. R. Pannell. Lecture before Aeronautical Soc. of Gt. Britain. 4000 w. A A Wkly—Jan. 14, 1918. Serial, 1st part. Value of model experiments, describing wind channels.

Mufflers

Exhaust Headers and Mufflers for Airplane Engines (88043 B). Archibald Black. Ills. 5 pp. S A E, JI—Aug., 1918. Data collected on this subject. Typical constructions, designs, etc.

Naval Aircraft

Italian Naval Aircraft (83763 A). Ills. 700 w. Engr—Jan. 4, 1918. Details of a system of defence for the Adriatic, showing typical units.

Nomenclature

Airplane Nomenclature. Also, War Airplanes of To-day (87366). Ills. 1500 w. Auto Ind—July 4, 1918. Serial, 1st part. Names of different types of planes used in warfare, and of principal parts.

Nomenclature for Aeronautics (86,074). 3500 w. A A Wkly—May 6, 1918. Prepared by the National Advisory Committee for aeronautics.

Panhard Motor

The Panhard—300 H. P. (Direct Type Aviation Motor) (89601). E. H. Shermundy. Ills. 1000 w. A A Wkly—Oct. 21, 1918. Motor designated as (V-12-J) and comprised of 12 cylinders, is described.

Photography

See German Aviation.

Military Aerial Photography (84219 A). M. Gervais-Courtellemont. Ills. 1000 w. Flying—Feb., 1918. Technical details.

Problems

Present-Day Problems in Aeronautics (87046). W. B. Stout. Ills. 6000 w. Auto Ind—June 20, 1918. How can we secure the advantages which the monoplane offers, reduce the resistance of the biplane, and obtain greater aerodynamic ability in the airplane?

Propellers

Characteristics of the Aerial Propeller (88360). S. E. Slocum. Ills. 2000 w. A A Wkly—Aug. 26, 1918. Serial, 1st part. Results of experiments, with formulas.

Conventional Propeller Calculations (88042 B). F. W. Caldwell. Ills. 10 pp. S A E, JI—Aug., 1918. Shows how calculations for determining strength and efficiency should be made.

Predicting Strength and Efficiency of Aeroplane Propellers (87989). F. W. Caldwell. Ills. 2000 w. A A Wkly—Aug. 5, 1918. Charts and formulae for calculating h. p. absorbed and torque delivered at given engine and plane speeds.

La Fabrication Mécanique Des Hélices Aériennes (84608 B). J. Boyer. Ills. 2300 w. La Nature—Jan. 12, 1918.

Construction of aeroplane propellers. Methods of increasing production by machines.

Predicting Strength and Efficiency of Airplane Propellers (87655). F. W. Caldwell. Ills. 1800 w. Auto Ind—July 18, 1918. Charts and formulae for calculating horsepower absorbed and torque delivered at given engine and plane speeds.

Air Propulsion (87351). Morgan Brooks. Ills. 1800 w. A A Wkly—July 15, 1918. Applications of the super-speed theory as it relates to propellers and blowers.

Automatic Airplane Propeller Shaping Machine (83753 A). Ills. 1200 w. Engng—Dec. 21, 1917. Detailed description of a British machine tool of interest.

Standard Hub for Airplane Propellers (83527). Fred H. Colvin. Ills. 500 w. Am Mach—Jan. 10, 1918. Details of hub adopted by the aviation section of the United States army.

La Fabrication Des Hélices D'Aéropplanes (85122 B). 1200 w. Le Génie Civil—Feb. 2, 1918. The Wadkin Machine for fashioning airplane propellers.

Propulsion

Air Propulsion (87962 A). Ills. 5500 w. A S M E, JI—Aug., 1918. Discussion of Morgan Brook's paper.

Range Finders

The Principles of Range Finders and Bomb Sights for Aircraft (84804). C. Levick. 1500 w. A A Wkly—March 11, 1918. General elementary principles.

Route Indicator

The "Crocco" Route Indicator and Its Noteworthy Applications (84979). Ills. 5000 w. A A Wkly—March 18, 1918. Describes measurements and applications, etc.

Scout

Details of the Pfalz Single-Seater (88695). Ills. 1400 w. Auto Ind—Sept. 5, 1918. Serial, 1st part. Performance.

Sea Flying

Flying Boat and Hydroaeroplane for Sea Flying (86692 A). Giuseppe Adamoli. Ills. 3000 w. Flying—June, 1918. Limitations of the double float seaplane for rough water landing; training flying; boat pilots; starting; landing, etc.

AUTOMOBILES

Agriculture

Seaplanes

American Seaplane to Fly the Atlantic (87237). Map. 3000 w. Auto Ind—June 27, 1918. Rolls Royce equipped machine carrying three men probably will go via Newfoundland and Azores in September.

Seaplanes on Water (82880 A). Godfrey L. Cabot. Ills. 3000 w. Flying—Dec., 1917. Suggestions of interest to fliers by water.

Specifications

International Aircraft Standards (82352 A). 13 pp. Flying—Nov., 1917. Specifications adopted by the International Aircraft Standards Board.

Spinning

Spinning (85216). Dean I. Lamb. 2000 w. A A Wkly—March 25, 1918. A study of the problem.

Stability

Stability in General (82998). Harlan D. Fowler. Ills. 3000 w. A A Wkly—Dec. 17, 1917. Serial, 1st part. Consideration of stability on all present forms of aircraft, giving mathematical laboratory solutions.

Stabilizers

La Stabilisation Des Navires Et Des Avions (82654 B). H. Volta. Ills. 2200 w. La Nature—Oct. 20, 1917. Gyroscopic stabilizers for ships and airplanes.

Standardization

Current Standardization Work (85383 B). Ills. 2000 w. S A E, JI—March, 1918. Outline of work at recent meetings of the Aeronautic and Marine Divisions of the Standards Committee.

Steel Tubing

Steel Tubes, Tube Manipulation, and Tubular Structures for Aircraft (87073). W. W. Hackett and A. G. Hackett. 4000 w. A A Wkly—June 24, 1918. Reviews methods of manufacture, some of the difficulties, tests, etc.

Seamless Steel Tubing (87157). 1000 w. Times Engng Supp—May, 1918. Abstract of paper by W. W. and A. G. Hackett before Aeronautical Society, England.

Training

Intensive Training in An Aircraft Plant (88512). Frank L. Glynn. Ills. 1000 w.

Auto Ind—Aug. 29, 1918. Instruction at Curtiss Company's school.

Training Tractor

The Continental KB—3T Training Tractor (89602). Ills. 800 w. A A Wkly—Oct. 21, 1918. Designed to produce a machine that could be cheaply built.

Transatlantic Flight

Transatlantic Flight This Year (87243). 3500 w. A A Wkly—July 1, 1918. General Brancker's views on ways to cross the ocean in transatlantic flight.

Flight Across Atlantic Should Be Made as Soon as Possible (87368 A). William S. Brancker. Ills. 3300 w. Flying—July, 1918. The prospects for a successful flight considered promising.

Offer 10,000 Planes to Fly to France (87331). 2000 w. A A Wkly—July 8, 1918. Urges the undertaking and argues its practicability.

Triplane

The Sopwith Triplane (86177). Ills. 1000 w. Auto Ind—May 9, 1918. New British scout. Has low specific wing load and excellent climbing abilities.

The Fokker Triplane (86718 A). 1000 w. Engr—May 10, 1918. Considers it one of the poorest of modern German designs.

War

War and Aeronautics (83806 A). William E. Beard. 5000 w. U S Nav Inst, Pro—Dec., 1917. The use of balloons in the Civil War.

Wind Tunnels

Design and Use of Wind Tunnels (85382 B). J. R. Pannell. 10,500 w. S A E, JI—March, 1918. From paper before Aeronautical Society of Great Britain. Types, developments in different countries and related topics.

Wood

The "Grain" of Wood With Special Reference to the Direction to the Fibres (88113). Arthur Koehler. Ills. 2500 w. A A Wkly—Aug. 12, 1918. Matters of importance in selecting wood for aeroplane construction.

AUTOMOBILES

Accessories

New Ideas in Automobile Accessories (85950 A). Ills. 1500 w. Aust Min Stand—March 21, 1918. Details of many appliances found useful.

Agriculture

Steam Ploughing and Cultivating Equipment (87550 A). Ills. 3300 w. Engr—June 21, 1918. Details of modern ploughing engines and implements in Great Britain.

Consult Classification of the Index. See page 9.

AUTOMOBILES

Design

Annual Show

Mechanical Tendencies Revealed by the Show (83561). P. M. Heldt. Ills. 3500 w. Auto Ind—Jan. 10, 1918. Interesting developments seen at the New York show.

Antifreezing Solutions

Antifreezing Solutions for Automobile Radiators (89311 B). 1000 w. S A E, J1—Oct., 1918. Conclusions from investigations made by the U. S. Bureau of Standards.

Automobiles

Efficient Transportation Demanded by Engineers (83504 A). J. Edward Schipper. 3000 w. Auto Ind—Jan. 3, 1918. (Special No.) Change of practice necessary to eliminate extravagance of wheel base and engine size.

Automotive Engineering

Automotive Engineering in the War (82151 A). George W. Dunham. Address at Buffalo. 3000 w. S A E, J1—Oct., 1917. Outlines the activities, which include transporting men and munitions; motorization of field artillery; purpose of "Liberty Engine," development of farm tractors, etc.

Axles

Possibilities for Standardization in Tractor Front Axles (88263). Ills. 700 w. Auto Ind—Aug. 15, 1918. Present variety of type could be replaced by a few standard designs which would meet all requirements.

The Rails Axle Suspension (82358 A). Ills. 2000 w. Autocar—Oct. 27, 1917. A device which allows horizontal as well as vertical movement of the axle.

Design of Military Truck Axles (83703). G. W. Carlson. Ills. 2000 w. Auto Ind—Jan. 17, 1918. Engineering details of front and rear axles of Class B military worm-driven truck.

Bearings

Some Fundamentals of Rolling Support (85376 B). F. W. Gurney, with discussion. Ills. 4000 w. S A E, J1—March, 1918. Ball vs. roller bearings, construction, difficulties, etc.

Bodies

The Shell Body (88837 A). Eric W. Walford. Ills. 1000 w. Autocar—Aug. 17, 1918. Low weight and ample luggage carrying capacity two features. Its advantages.

Quantity Production of Sheet Metal Bodies (87048). J. Edward Schipper. Ills. 2200 w. Auto Ind—June 20, 1918. Serial, 1st part. Methods used.

Automobile Body Design and Construction (85917 B). E. W. Goodwin, with dis-

cussion. 7000 w. S A E, J1—April, 1918. Influence of chassis design; seating; details of construction, etc.

Car Drivers

The Wrens and their Work (89521 A). Ills. 2000 w. Autocar—Sept. 21, 1918. Details concerning the qualifications and duties of the car driver "ratings" in the Women's Royal Naval Service.

Car Tooling

Tooling a Foreign Car in America (83419 A). Thomas Orchard. Ills. 1400 w. Machy—Jan., 1918. Serial, 1st part. Interesting jigs and fixtures used in tooling an automobile of foreign design.

Coal Gas

Coal Gas for Motor Vehicles (82675). 1400 w. Times Engng Supp—Oct. 26, 1917. Methods of storage discussed before Manchester and Liverpool District Commercial Motor Users' Association.

Coal Gas for Motor Traction (82662 A). H. E. Wimperis. Ills. 1000 w. Nature—Nov. 1, 1917. Gasoline Motor bus adopted to use coal gas as fuel.

Coal Gas for Motor Traction (82278 A). W. M. Barrett. With review by Rayner Roberts. Ills. 8500 w. Autocar—Oct. 20, 1917. Subject received and progress reported. Systems described and criticized.

Coal Gas for Motor Traction (82135 A). 3000 w. Mech Wld—Oct. 12, 1917. Serial, 1st part. Report of the Executive Committee of the British Commercial Gas Association. Advantages and disadvantages.

Contact Breaker

A New Bosch Magneto Contact Breaker (86032 A). Ills. 3000 w. Autocar—April 13, 1918. Said to result in a better spark, longer life of contacts, and other advantages.

Crankshafts

Problems of Crankshaft Design (82715 B). Otto M. Burkhardt, with discussion. Ills. 7500 w. S A E, J1—Nov., 1917. Discusses balancing crankshafts of internal combustion engines and related topics.

Design

American Automobile Design (84825 A). A. Ludlow Clayden. Ills. 2500 w. Autocar—Feb. 16, 1918. Serial, 1st part. Explains disadvantage of large outputs; the problem of heavy grade fuel, etc.

Automatic Design and Transportation as Developed by the War (84683). J. Edward Schipper. Read before Detroit Sec. of S. A. E. 3500 w. Auto Ind—Feb. 28, 1918. Tendencies in design revealed by new models.

AUTOMOBILES

Engines

Development

Pioneer Automobile Development (86588 B). Prescott Warren. 3000 w. S A E, JI—May, 1918. Reviews the history and states the attributes of the ideal car.

Differentials

Positive Pull Differentials (87050). A. C. Woodbury. Ills. 4500 w. Auto Ind—June 20, 1918. Various types and their action in turning corners and when one wheel loses traction.

Douglas Car

The Post-War Douglas Light Car (88590 A). Ills. 1000 w. Autocar—Aug. 10, 1918. Details of design. A striking departure in the suspension system.

Drivers

War Truck Driver Qualifications (85484). W. F. Bradley. Ills. 1800 w. Auto Ind—April 14, 1918. Military training essential.

Efficiency

Automotive Industrial Efficiency (84043 B). George C. McMullen. Chart & Ills. 5000 w. S A E, JI—Jan., 1918. Requirements essential to successful production.

Electric Tractors

New Freight-Handling System at Gotham Dock Eliminates Motor Truck Delays (82251 A). Ills. 1500 w. Com Vhle—Nov. 1, 1917. Electric industrial trailers and tractors accomplish work more cheaply than men.

Electric Tractors and Trucks (84318). Ills. 6000 w. Ry Rev—Feb. 16, 1918. Types used, their efficiency, etc.

Electric Trucks

How the Electric Truck Releases Men for Productive Work. (85279 A). F. C. Myers. Ills. 1800 w. Ind Man—April, 1918. Types and their uses and operation.

Electric Vehicles

The Electric Commercial Vehicle (86135 A). 3500 w. Engr—April 12, 1918. Causes of failure in the past, drawbacks, uses for which they are suited, advantages, etc.

The Electric Vehicle as a War Measure (87241). James H. McGraw. Ills. 2500 w. Elec Wld—June 29, 1918. Its part in the nation's transportation problem.

Electric Vehicle a Factor in Transportation Engineering (84950). Ills. 2000 w. Elec Rev, Chi—March 16, 1918. Growth in use of electric vehicles; economies.

The Electric Vehicle for Handling Goods in the Works and on the Road (83370 N). Raymond J. Mitchell. Ills. 4000 w. Elec'n—Dec. 14, 1917. The scope of the electric vehicle, construction of chassis, etc.

Engine Cooling

Principles of Tractor Engine Cooling (84550 B). Arthur B. Modine. Ills. 2500 w. S A E, JI—Feb., 1918. Essentials of cooling, giving a formula for radiator sizes and recommendations for water circulation, air velocity, and fan details.

Engine Design

Nomography in Engine Design (88572 B). F. Leigh Martineau. Charts. 4000 w. S A E, JI—Sept., 1918. Read before Instn. Auto. Engrs, London. Graphic presentation of formulae.

Engine Practice

Fundamentals of Engine Practice Reopened for Discussion (86538). J. E. Schipper. Ills. 1500 w. Auto Ind—May 23, 1918. Changes in valve location, manifold layouts and possibilities of overhead camshaft types.

Engines

Oil-Burning Tractor Engines (88571 B). H. T. Sward, with discussion. 3000 w. S A E, JI—Sept., 1918. The requirements, fuel, etc.

Tests of a Sleeve Valve Engine (88983). Ills. 2000 w. Auto Ind—Sept. 19, 1918. Characteristics of the engine of the American Sleeve Valve Motor Corp.

Continental Model 9N Engine (86063). Ills. 1000 w. Auto Ind—May 2, 1918. Succeeds model 7N. Has heavier crankshaft which is very carefully balanced.

Buda Model "H T U" Engine (88269). Ills. 1400 w. Auto Ind—Aug. 15, 1918. Designed for truck and tractor service. Detailed description.

Possibilities of the Hvid Engine (88047 B). E. B. Blakely, with discussion. Ills. 8 pp. S A E, JI—Aug., 1918. Operation, trials, etc.

Car and Aircraft Engines (85515 A). Ills. 2000 w. Autocar—March 16, 1918. Extent to which car engine design will be affected by aero engine developments. Comparison between the features of the two types.

U. S. A. Motorcycle Engine Completed (85183). P. M. Heldt. Ills. 3000 w. Auto Ind—March 21, 1918. Of two-cylinder, vee, air-cooled type, capable of developing 15 B hp.

Changes in Peerless Eight and Reasons Therefor (84294). Ills. 700 w. Auto Ind—Feb. 14, 1918. Important and minor changes made.

Design of Class B Truck Engine (84037 B). A. F. Milbrath. Diagrams. 2500 w. S A E, JI—Jan., 1918. Requirements and details of design.

Fundamentals of Tractor Engine Design (84197). H. C. Buffington. Ills.

Engine Valves

2500 w. Auto Ind—Feb. 7, 1918. Features advocated.

Reasons Behind the Class B Engine (83702). A. F. Milbrath. Diagrams. 2500 w. Auto Ind—Jan. 17, 1918. Technical analysis of its design. Performance in tests.

The Howard Cuff Valve Engine (83-023 A). Ills. 2500 w. Autocar—Dec. 1, 1917. Attempt to combine the good points of sleeve and poppet valves and of overcoming their principal objections.

Why Water Injection May Cause an Increase of Power (83121). P. M. Heldt. 2000 w. Auto Ind—Dec. 20, 1917. Conversion of heat into mechanical energy most efficient at middle part of stroke. See also page 220

Templar Four Employs Improved Overhead Valve Construction (85598). Ills. 1600 w. Auto Ind—May 30, 1918. Small-bore, high-speed engine used on 118-in. wheelbase chassis.

Test Results of the Hvid Engine (87054). 1500 w. Auto Ind—June 20, 1918. Tests made at Armour Inst. of Technology under direction of Daniel Roesch.

Engine Valves

Improvement in Engine Valves (86-176). J. Edward Schipper. Ills. 1000 w. Auto Ind—May 9, 1918. New valve materials adopted partly as a result of scarcity of tungsten.

Exhaust Headers

Exhaust Headers and Mufflers (87817). Archibald Black. Ills. 3000 w. Auto Ind—July 25, 1918. An S. A. E. paper considering the subject from the standpoint of aircraft engineering. Present practice reviewed and conclusions.

Farm Tractors

Farmers' Service Requirements (84548 B). George Cormack. 4000 w. S A E, JI—Feb., 1918. Urges the designing and building of the best tractor for the service.

France

French Automobile Industry After the War (85725). G. Lumet. 2200 w. Auto Ind—April 18, 1918. Questions to be solved in relation to the industry.

Fuels

Fuel for Automotive Apparatus (83813 A). E. W. Dean. Read before S. A. E. 6000 w. Auto Ind—Jan. 24, 1918. Distillation curves of the different fuels and their adaptability to present-day engines.

Petrol's Part in the Great War (83747 A). Albert Lidgett. Ills. 2500 w. Autocar—Jan. 5, 1918. Shows the great part motor spirit plays.

Fuel for Automotive Apparatus (84040 B). E. W. Dean. 6000 w. S A E, JI—

AUTOMOBILES**Headlights**

Jan., 1918. Deals with liquid fuels for internal combustion engines.

Fuels for Tractor Engines (85379 B). J. L. Mowry, with discussion. 3500 w. S A E, JI—March, 1918. Engine production and operation; field observations; possible fuels and conclusions.

Heated Passage vs. Hot-Spot System (84947). Percival S. Tice. 1800 w. Auto Ind—March 14, 1918. Comparison of the two methods.

Coal Gas as Motor Fuel (83086 A). P. G. G. Moon. Ills. 1800 w. Autocar—Nov. 10, 1917. Suggestions connecting the use of coal gas, stored in collapsible containers, as fuel for cars.

Fuel, Storage

The Wood-Milne Gas Container (83-087 A). Rayner Roberts. 2000 w. Autocar—Nov. 10, 1917. Possibility of alternative types for high and low-pressure storage.

Garage

New York's Model Post Office Garage Can Accommodate 200 Mail Trucks (88060 A). Ills. 2000 w. Com Vhle—Aug. 1, 1918. Serial, 1st part. Provides all facilities for the maintenance of the 155 trucks in use.

Gear Shift

A Mechanism for Changing Gears Automatically (88696). Ills. 1200 w. Auto Ind—Sept. 5, 1918. Gears shifted and clutch operated by engine power.

Glass Fronts

Design of Automobile Glass Fronts (86062). Karl Feilcke. Ills. 1600 w. Auto Ind—May 2, 1918. Serial, 1st part. Proper design of windshields; functions and how best attained; difficulties and how eliminated.

Headlamps

Report of the 1916-17 Committee on Automobile Headlamps (87757 C). 90 pp. Ill Eng Soc, Trans—July 20, 1918. Outline of the problem; requirements; optical principles; safety limitations, etc.

Headlights

Headlight Illumination Requirements (85727). Ills. 2000 w. Auto Ind—April 18, 1918. Tests made to determine minimum illumination required and maximum glare tolerable.

Automobile Headlights and Glare-reducing Devices (88681 A). L. C. Porter. Ills. 2200 w. Gen Elec Rev—Sept., 1918. Methods in common use; and correct use.

Report on Road Test of Headlighting Conditions Made Under the Auspices of the Committee on Automobile Headlighting Specifications of the Illuminating Engineering Society and the Lighting Division of the Standards

Ignition**AUTOMOBILES****Magnetos**

Committee of the Society of Automotive Engineers (86428 N). 25 pp. Ill Eng Soc—April 11, 1918. Report of the 1916-17 committee on automobile head lamps.

The Automobile Headlighting Problem Again (82265 A). Evan J. Edwards. Ills. 1800 w. Gen Elec Rev—Nov., 1917. Analyzes the advantages and disadvantages of the fixed, the controllable, and the diffusing systems, recommending the controllable.

Heat-Flow Through Cylinder Walls (84041 B). Louis Illmer. 7000 w. S A E, JI—Jan., 1918. Research study into speed limitations of internal-combustion engines imposed by excessive heat-flow.

Ignition

Magneto Ignition (83259). Ills. 3500 w. A A Wkly—Dec. 31, 1917. Serial, 1st part. Explanation of the fundamental principles and general arrangement of H. T. Magnetos.

Magneto vs. Battery Ignition (83, 177 B). J. A. Williams. Ills. 4500 w. S A E, JI—Dec., 1917. Favors modern high-tension magneto.

Magneto Ignition for Farm Tractors (87300 A). J. G. Zimmerman, with discussion. Ills. 3000 w. S A E, JI—June, 1918. Matters of importance in the proper installation of magnetos and the principles underlying their construction.

Spontaneous Ignition (83373 A). 1500 w. Autocar—Dec. 22, 1917. Explanation of the causes of knocking and how they may be overcome.

Testing Electric Ignition Apparatus (84660 A). J. D. Morgan. Ills. 1000 w. Engng—Feb. 8, 1918. Note on the measurement of current in electric ignition spark circuits.

Industrial Trucks

New Type "Hunt" Electric Industrial Truck (84137 A). Ills. 500 w. Elec'n—Jan. 18, 1918. Specification and points of interest.

Inspection

Factory Inspection (89308 B). Walter C. Keys, with discussion. 3500 w. S A E, JI—Oct., 1918. As applied to manufacturing and particularly to the automotive industries.

Inspection (82681). 1300 w. Times Engng Supp—Oct. 26, 1917. Presidential address to Institution of Automobile Engineers of Great Britain. Women inspectors and their work.

Jack

The B. G. R. Hydraulic Jack (83055 A). Ills. 1700 w. Autocar—Nov. 24, 1917. An engine-operated system.

Japan

Japan Wants Small Chassis (83252). H. Sibley. Ills. 2000 w. Auto Ind—Dec. 27, 1917. Requirements to meet conditions.

Liquid Fuels

Liquid Fuel from Cannel Coal (86824 A). W. R. Ormandy. Ills. 1000 w. Autocar—May 25, 1918. A consideration of the possibilities and a comparison of cannel with other coals.

Loading Methods

Proper Methods of Loading Automobiles (89632). Ills. 3000 w. Ry Rev—Oct. 19, 1918. Analysis of methods employed by shippers and a representative railroad.

Lorries

Designing by Committee (84010 A). Ills. 1000 w. Autocar—Jan. 12, 1918. Account of the designing of the U. S. A. war lorry.

Lubrication

Grease vs. Oil for Chassis Lubrication (87979). Ills. 1500 w. Auto Ind—Aug. 1, 1918. Opinions differ as to the advantages of each.

New Methods of Chassis Lubrication (84681). Cornelius T. Myers. Ills. 4000 w. Auto Ind—Feb. 28, 1918. Designs for minimizing attention and increasing life.

A New Chassis Lubrication System (87653). Ills. 700 w. Auto Ind—July 18, 1918. A scheme by which oil is fed to bearings by wicks.

Lubrication of Tractor Engines (86592 B). W. G. Clark, with discussion. 8000 w. S A E, JI—May, 1918. Types of oiling systems; selection and tests of lubricants.

Tractor Engine Lubrication and Lubricating Oils (85728). W. G. Clark. 5000 w. Auto Ind—April 18, 1918. Tests carried out to determine suitable oils for a particular engine.

Magnetos

Non-Distributor and Multipolar Magnetos (88094). Fred I. Hoffman. Ills. 1400 w. Auto Ind—Aug. 8, 1918. Practical possibilities of magnetos designed for use with separate distributors in the engine camshaft.

Electrical Performance of the Transforming Magneto-Generator (87049). Harry F. Geist. Ills. 3000 w. Auto Ind—June 20, 1918. Explains what takes place electrically in a self-contained high tension magneto.

Ignition Magneto Construction (89307 B). H. R. Van Deventer. Ills. 4500 w. S A E, JI—Oct., 1918. Types and testing methods. Mechanical defects cause the largest part of magneto troubles.

Manifolds

Pole Pieces for Magnetos (85729). Fred I. Hoffman. Ills. 1200 w. Auto Ind—April 18, 1918. Unusual shapes given the pole tips with the object of widening the peak of the voltage curve and insuring a hot spark for starting when the spark is retarded.

Manifolds

Modern Manifolds (83505 A). Ills. 1000 w. Auto Ind—Jan. 3, 1918. (Special No.) Study of the intake manifold and methods for preheating it.

Metallurgy

Metallurgy in the Automotive Industry (82152 A). Ralph H. Sherry. 10500 w. S A E, JI—Oct., 1917. Shows the connection between metallurgical and factory work.

Military Transport

Rail and Motor Transport as Applied to Military Operations (84489 B). P. S. Bond. 15 pp. Prof-Mem—Jan.-Feb., 1918. Effect of transportation on warfare.

Military Trucks

Acceptance of Military Trucks (82150 A). Ills. 3500 w. S A E, JI—Oct., 1917. Report of acceptance of the first two heavy duty (Class B) war trucks, giving details of design.

Military Motor Trucks in the Great War (85919 B). H. L. Horning. 1500 w. S A E, JI—April, 1918. Argument for standard trucks.

Mobilization Depot

A Motor Transport Mobilization Depot (83352 A). Ills. 1800 w. Autocar—Dec. 15, 1917. A permanent camp for men, vehicles and stores for oversea service.

Motorcycles

The Harley - Davidson Motorcycle (82592). Ills. 3000 w. Auto Ind—Nov. 22, 1917. Detailed description.

Motor Fuel

Motor Spirit and Gas: A Consolidation Order (84011 A). 3500 w. Autocar—Jan. 12, 1918. Text of an English order for restricting use.

A Heavy Oil Burning Arrangement for Motor Cars (89142 A). Ills. 1500 w. Engr—Sept. 13, 1918. An arrangement designed to burn tar oil on a touring car. The operation and cost.

Liquid Fuel from Coal (80126 A). W. R. Ormandy. 1500 w. Autocar—Sept. 14, 1918. Shows how the final report of the Coal Conservation Committee is of direct interest to motor car users. Interrelation of pig iron, coke, and benzole.

Alcohol As a Motor Fuel (85821). J. E. MacCormick. 3000 w. Pr House—March, 1918. Serial. 1st part. Shows

AUTOMOBILES**Motor Trucks**

that alcohol cannot compete with gasoline.

The Ideal Motor House (85517 A). Ills. 1200 w. Autocar—March 23, 1918. Suggestions as to requirements of the owner-driver.

Motor Sweepers

City of Buffalo Finds Motor Sweepers More Efficient Than Horses (86648 A). George W. Grupp. Ills. 1500 w. Com Vhle—June 1, 1918. Advantages.

Motor Transport

Recent Observations in France (87772 A). David S. Ludlum. 3500 w. E Cb Phila, JI—July, 1918. Popular account of a trip to France to study motor transport service of the army.

Motor Vehicles in Telephone Work (87694). Ills. 1800 w. Telephony—July 20, 1918. The efficiency of power vehicles with special bodies and equipment. Requirements.

Motor Transport Corps Under Brig.-Gen. Drake (88332). Allen Sinsheimer. 2800 w. Auto Ind—Aug. 22, 1918. New corps will control all motor apparatus except ambulances, tanks and tractors.

Army Transportation (83331 A). L. B. Moody. Ills. 500 w. A S M E, JI—Jan., 1918. The importance of motor equipment in the Ordnance Department.

Motor Truck

Parcel Post by Motor Truck (84954). 3000 w. Br Rds & Sts—March, 1918. Address of Hon. James J. Blakslee at the War Roads Convention, Columbus, O.

Motor Trucks in War and Commercial Service (85378 B). G. W. Smith. 2000 w. S A E, JI—March, 1918. Changes desirable for required service.

Varied Uses of Motor Trucks Bring Bigger Profits to Enterprising Farmers (85457 A). Ills. 2000 w. Com Vhle—April 1, 1918. Motorized equipment essential to success in coming season.

Akron to Boston (84386 A). Joseph Husson. Ills. 3500 w. Com Vhle—Feb. 15, 1918. Account of 740 miles on regular schedule.

Chassis Design of Class B Motor Trucks (84036 B). Cornelius T. Myers. Ills. 2500 w. S A E, JI—Jan., 1918. Details.

Transmissions for the Class B Truck (84038 B). A. W. Copland. Ills. 1700 w. S A E, JI—Jan., 1918. Details of transmission and practice.

Need of Motor Truck Makers for Materials and Fuel (87815). 3000 w. Auto Ind—July 25, 1918. Text of presentation before the War Industries Board.

Specifications of Light U. S. Army Truck (88049 B). 3500 w. S A E, JI—Aug., 1918.

AUTOMOBILES

Springs

New Trucks

1918 Motor Trucks and Their Makers. Plans in Brief Illustrated Résumé (82-512). Ills. 21 pp. Com Vhle—Nov. 15, 1917. Serial, 1st part. New models and prices, changes in construction and methods of manufacture.

New Truck Has Air Suspension (82-324). Ills. 700 w. Auto Ind—Nov. 8, 1917. Adjustable pneumatic springs care for variations in load.

Ordnance

Types of Ordnance Vehicles (87238). Ills. 1800 w. Auto Ind—June 27, 1918. Exhibits at Dayton meeting of S. A. E.

Parts List

A Systematic Parts List (84047). R. C. Barron. 2000 w. Auto Ind—Jan. 31, 1918. Nature and need for it in manufacturing.

Passenger Cars

What the Automobile User Is Demanding (84198). J. Edward Schipper. 3500 w. Auto Ind—Feb. 7, 1918. Read before Cleveland Sec., S. A. E. Demands affected by the war.

Performance Tests

Performance Tests by Accelerometer (85937). H. C. Skinner. 1000 w. Auto Ind—April 25, 1918. Means of determining traction resistance; calculation of engine horsepower.

Petrol

Further Petrol Restrictions (82279 A). Ills. 2500 w. Autocar—Oct. 20, 1917. Full text of motor spirit restriction order coming into effect Nov. 1st, in England.

Petrol Storage

The Storage of Petrol (85242 A). 1800 w. Autocar—March 9, 1918. Present position and the effect of a regulation issued under the Defense of the Realm Act.

Pistons

Aluminum Piston Development (86893). J. Edward Schipper. Ills. 2200 w. Auto Ind—June 13, 1918. Reduced expansion sought in new mixtures with closer grain.

Plowing

Graphs Show Cost of Plowing (82-950). E. Goldberger. 2000 w. Auto Ind—Dec. 6, 1917. Quick method of comparing cost of work with different sizes of tractor and different depths of plowing on average soil.

Racing

Racing, Its Advantages, and Its Influence on Automobile Design (82894). Robert Bruce White. 2000 w. Wis Engr—Nov., 1917. Developments attributed to racing.

Reducing Valve

The Flugel Pressure Reduction Valve (83085 A). Ills. 1500 w. Autocar—

Nov. 10, 1917. A device necessary between the container and the engine when coal gas is stored at high pressure.

Remy System

Remy System Combines Governor with Generator (86064). Ills. 900 w. Auto Ind—May 2, 1918. Adapted particularly to tractor use.

Repair Depot

First Standardized Repair Depot for Quartermaster Mechanical Transport (84948). Allen Sinsheimer. Ills. 1000 w. Auto Ind—March 14, 1918. Depot to supply cantonnements. Model for others here and in France.

Requirements

Present Requirements of the Automobile User (85377 B). J. Edward Schipper, with discussion. 4500 w. S A E, J1—March, 1918. Demands for performance, appearance, reliability, economy, etc.

Road Haulage

Traction on Bad Roads or Land (84284 A). L. A. Legros. Ills. 3000 w. Engng—Jan. 25, 1918. Serial, 1st part. Methods of overcoming difficulties peculiar to such traction.

Selling

Analysis of Automobile Merchandizing in New Zealand (89289). G. A. Worrall. Ills. 2500 w. Auto Ind—Oct. 3, 1918. Serial, 1st part. Effects from the advent of American cars in 1915 and 1916. Possibilities of the wool industry.

Shock Absorbers

Shock Absorbers for Easy Riding (87301 A). Mark H. Landis, with discussion. Ills. 12000 w. S A E, J1—June, 1918. Requisites of an ideal shock absorber and essential conditions of its design.

Snow Removal

New York State Failed to Remove Snow (84790). David Beecroft. 2500 w. Auto Ind—March 7, 1918. War trucks average 37.4 miles per day in Empire State but 6.7 miles over Detroit-Seaport route. Difference due to snow removal.

Spark Plugs

Special Spark Plugs Needed for Airplane Engines (83508 A). Ills. 4000 w. Auto Ind—Jan. 3, 1918. (Special No.) Factors which determine the construction are heat, oil conditions and gas tightness and insulation qualities under heat.

Springs

Spring Design for Easy Riding (83-175 B). Walter C. Keys, with discussion. Ills. 6000 w. S A E, J1—Dec., 1917. Types of suspension, functions of rear springs, riding qualities, etc.

Standardization

The Mechanics of Tractor Spring-Mounting (84946). E. Goldberger. Ills. 2500 w. Auto Ind—March 14, 1918. Analytical investigation of effects when tractors pass over rigid obstacles.

Standardization

Standardization at the Semi-Annual Meeting (87485 B). Ills. 20 pp. S A E, JI—July, 1918. Division reports as accepted at June 17th meeting of the S. A. E.

Starters

Impulse Starters for Tractors (83506 A). Ills. 1800 w. Auto Ind—Jan. 3, 1918. (Special No.) Enable a starting spark to be obtained without spinning engine.

Starting

Effects of Low Temperatures on Starting (84437). O. W. A. Oetting. Ills. 3000 w. Auto Ind—Feb. 21, 1918. Congealing of oil and decrease in efficiency of starters at low speeds.

Effects of Low Temperatures on Starting (85380 B). 3500 w. S A E, JI—March, 1918. Discussion at Cleveland section meeting.

Sedan

Staggered Door Sedan (85601). George T. Mercer. Ills. 1500 w. Auto Ind—April 11, 1918. Details of a suggested design.

Senate Report

Automobile Industry Unjustly Censured in Senate Report (88511). J. Edward Schipper. 1800 w. Auto Ind—Aug. 29, 1918. Cause of slow production explained.

Steam Cars

Electrically-Controlled Steam Automobiles (86589 B). Abner Doble. Ills. 6500 w. S A E, JI—May, 1918. Development of steam cars; steam generators; ignition system; engines; lubrication, etc.

Discussion on Steam Automobiles at Metropolitan Section Meeting (86591 B). 6500 w. S A E, JI—May, 1918.

The Case of the Steam Car (86590 B). John Sturgess. Ills. 5000 w. S A E, JI—May, 1918. Relates particularly to the Stanley car; why they are built, etc.

Steam Engines

Steam Engines in the Automotive Field (82716 B). E. T. Adams. 2500 w. S A E, JI—Nov., 1917. Advantages, types of boiler design, economies, etc.

Steam Motors

A New Coke Fuel Steam Motor (88616 A). Ills. 1500 w. Engr—Aug. 2, 1918. Details of design of an engine for a mechanically-propelling road vehicle.

New Steam Motor (89076). 1200 w. Times Engng Supp—Aug., 1918. New truck motor, a British design, using coke fuel for making steam.

AUTOMOBILES**Tractor Radiators**

The Steam Motor in the Automotive Field (82261 A). E. T. Adams. 2200 w. A S M E, JI—Nov., 1917. Its advantage for this service; reduction in cost, etc.

Steam Wagon

Six-Ton Steam Wagon (83134 A). Ills. 1200 w. Engr—Dec. 7, 1917. Describes leading features of vehicle built in England.

Tank Designs

Fuel Tanks and Other Sheet Metal Parts (84292). Ills. 1800 w. Auto Ind—Feb. 14, 1918. Tank designs worked out by Geuder, Paeschke, & Frey.

Tanks

The Forerunner of the Tank (89418 A). H. H. Manchester. Ills. 1500 w. Am Mach—Oct. 10, 1918. Describes some of the early forms of vehicles of similar character used over 20,000 years ago.

Tanks Industriels (87731 B). H. Volta. Ills. 2700 w. La Nature—June 15, 1918. The "caterpillar" principle applied to industrial tractors, excavators and other machines.

Testing

Laboratory Testing in the Automotive Industry (82714 B). R. M. Anderson, with discussion. 7800 w. S A E, JI—Nov., 1917. Scope of the work, justifying the expense.

Tires

Size, Inflation Pressure and Construction of Tires As Affecting Easy Riding (84042 B). W. S. Wolfe, with discussion. Ills. 5000 w. S A E, JI—Jan., 1918. Considers types, their qualities, etc.

Traction

Traction on Bad Roads of Land (84791). L. A. Legros. Read before Inst. Mech. Engrs. Ills. 3500 w. Auto Ind—March 7, 1918. Serial. 1st part. Comparison of wheel and chain-track methods of drive.

Tractor Hitches

Tractor Hitch Merits Serious Consideration (87239). J. Edward Schipper. Ills. 2500 w. Auto Ind—June 27, 1918. Governs tractive ability and steering, as well as many performance characteristics.

Tractor Engines

Doman Tractor Engines (87981). Ills. 1000 w. Auto Ind—Aug. 1, 1918. Made in three 4-cylinder models.

Tractor Radiators

Tractor Radiators, Their Calculation and Design (83704). Arthur B. Modine. Diagrams. 2500 w. Auto Ind—Jan. 17, 1918. Portion of heat input compared with jacket losses.

AUTOMOBILES

Tractors

Tractor Wheels

Rolling Resistance of Tractor Wheels (87299 A). Amos F. Moyer, with discussion. Ills. 4500 w. S A E, JI—June, 1918. Report of detailed studies and experiments.

Tractors

The Nuttall Tractor Transmission (88985). Ills. 1000 w. Auto Ind—Sept. 19, 1918. May be adapted to different designs of tractors.

The Peoria Kerosene Tractor (88513). Ills. 1500 w. Auto Ind—Aug. 29, 1918. Detailed description.

Comments on Some Tractor Problems (88333). Ills. 900 w. Auto Ind—Aug. 22, 1918. New tendencies in design.

Provision of Adequate Housing Facilities. Big Tractor Problem (88093). David Beecroft. 2200 w. Auto Ind—Aug. 8, 1918. Care of machines important as a conservation measure.

Steering Creeper and Two-Wheeled Tractors (88265). A. C. Woodbury. 2000 w. Auto Ind—Aug. 15, 1918. Outlines various plans for steering tractors by other methods than that involved in the Ackerman steering axle.

Industrial Tractors for Solving Freight Terminal Congestion (89514). Ills. 1800 w. Elec Rev, Chi—Oct. 12, 1918. Benefits from substituting mechanical for manual methods for handling freight.

Manufacturing the Caterpillar Tractor (89642 A). Frank A. Stanley. Ills. 1200 w. Am Mach—Oct. 24, 1918. Serial, 1st part. Some of the important shop processes of manufacturing this machine.

The Belt-Rail Creeper Tractor (89292). Ills. 1000 w. Auto Ind—Oct. 3, 1918. A machine differing in its creeper action, manufactured at St. Paul, Minn.

Tractor Experiences in Illinois (89309 B). Arnold P. Yerkes and L. M. Church. 6500 w. S A E, JI—Oct., 1918. Extracts from Farmers' Bul. 963, U. S. Dept. Agri. Discusses advantages and disadvantages, size of machine required, cost, length of life, etc.

Useful Data from Harrisburg Tests (89165). 2500 w. Auto Ind—Sept. 26, 1918. Tractor demonstration gives valuable performance information.

Larger Engine in Happy Farmer Tractor (87654). Ills. 1200 w. Auto Ind—July 18, 1918. Details of a new model.

Tractor Friction Transmissions (87302 A). Charles A. Trask, with discussion. Ills. 5000 w. S A E, JI—June, 1918. Description of friction transmission types and their applications.

Emerson-Brantingham Model A A Tractor (86891). P. M. Heldt. Ills. 2800 w. Auto Ind—June 13, 1918. A three to four-plow machine with inclosed internal-gear drive and an interesting combination of transmission and rear axle.

Moline Universal Model D Tractor (86736). P. M. Heldt. Ills. 2500 w. Auto Ind—June 6, 1918. Four-cylinder valve-in-head engine substituted for two-cylinder opposed.

R. & P. Tractor Has Enclosed Drive (86597). Ills. 1000 w. Auto Ind—May 30, 1918. Automobile type chassis employed with unit power-plant, transmitting drive through double reduction internal gear rear axle.

Design of an Enduring Tractor (83-174 B). F. H. Craven. 3500 w. S A E, JI—Dec., 1917. Details of an eight-year-old type and its performance in service.

Tractor Lighting, Starting and Ignition (83176 B). Burns Dick. 2000 w. S A E, JI—Dec., 1917. The question of standardization.

Trundaar Tractor of the Creeper Type (82984). Ills. 1500 w. Auto Ind—Dec. 13, 1917. Tread built on log-chain principle.

Rumely Adds Smaller Tractor Model (83811 A). Ills. 1800 w. Auto Ind—Jan. 24, 1918. Has a rating of 14-28 h.p.

Scotland Favors Light Farm Tractors (83507 A). 4000 w. Auto Ind—Jan. 3, 1918. (Special No.) More suitable for routine farm work.

An Agricultural Power Unit (83646 N). Alan E. L. Chorlton. Ills. 25 pp. Instn Aut Engrs—Dec., 1917. Serial, 1st part. Some factors governing the design of a small tractor.

Some British Agricultural Tractors and Haulers (83386 A). 3000 w. Engr—Dec. 14, 1917. Serial, 1st part. Progress in mechanical cultivation.

New French Vineyard Tractor (85186). W. F. Bradley. Ills. 1500 w. Auto Ind—March 21, 1918. Double worm drive in real axle; tread 37 inches.

La Moto-Armatura Di Stato In Italia (85105 B). A. Marozzi. Ills. 2000 w. Industria—Jan. 31, 1918. Development of the Agricultural tractor in Italy.

Tractor Gear Teeth and Materials (85185). A. W. Searratt. 1500 w. Auto Ind—March 21, 1918. Materials available for gears and their properties.

The Most Economical Size of Tractor (84792). E. Goldberger. 2000 w. Auto Ind—March 7, 1918. Analysis of costs of power plowing with tractors of different

Transmission

sizes. Read at Chicago meeting of S. A. E.

Demonstration of Tractors and Ploughs in Scotland (85528 A). 4500 w. Engr—March 15, 1918. Account of tests.

Manufacture of Worm Gear and Assembly Methods Factors in Fordson Tractor Success (85936). Ills. 2000 w. Auto Ind—April 25, 1918. Time saving process.

Resistance to Rolling of Tractor Wheels in Soft Ground (86349). Amos F. Moyer. 3500 w. Auto Ind—May 16, 1918. Preliminary report of research to determine relation between rolling resistance, specific load, wheel diameter, speed and other factors.

Factors Governing Small Tractor Design (84552 B). Alan E. L. Chorlton. Read before Instn. Auto Engrs., London. Ills. 5000 w. S A E, JI—Feb., 1918. Requirements for an agricultural power unit, principal uses governing design, etc.

Fundamentals of Tractor Design (84290). George T. Strite. 3500 w. Auto Ind—Feb. 14, 1918. Read at Chicago S. A. E. meeting. Deals with size, horsepower, and drawbar pull.

The Twin City "16" Oil Tractor (84291). P. M. Heldt. Ills. 2000 w. Auto Ind—Feb. 14, 1918. Chief characteristics described.

Traction Transmission (84196). E. R. Greer. Ills. 2000 w. Auto Ind—Feb. 7, 1918. Little chance for standardization. Pros and cons of different transmissions.

Transmissions

Hydraulic Power Transmission (86593 B). F. McDonough, with discussion. Ills. 3500 w. S A E, JI—May, 1918. Explanatory, stating merits.

Tractor Transmission Design (87051). N. B. Nelson. 1500 w. Auto Ind—June 20, 1918. Materials, types of shaft fittings and bearings to use.

Truck Axles

Design of Military Truck Axles (84039 B). G. W. Carlson. Ills. 1800 w. S A E, JI—Jan., 1918. Work of the axle engineers.

Truck Efficiency

Truck Efficiency Graphically Shown (83509 A). Francis W. Davis. 2000 w. Auto Ind—Jan. 3, 1918. (Special No.) Calculating truck's working capacity.

Truck Factory

A Pacific Coast Truck Factory (82471). Frank A. Stanley. Ills. 1500 w. Am Mach—Nov. 15, 1917. Methods used in the largest motor truck factory west of the Mississippi River.

Trucking

Cleveland Truck Company Delivers Steel, Meat, and Groceries When Rail-

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roads Fail (88548 A). Ills. 2500 w. Com Vhle—Sept. 1, 1918. Work of the Highways Motor Transport Co.

Motor Trucks and Buses Solve Problem of Transportation of War Industries Plants (89660). Ills. 1200 w. Mfrs Rec—Oct. 24, 1918. Account of work accomplished.

Trucks on Concrete Roadways Distribute Supplies at Railway Shops (86619). Con. M. Buck. Ills. 1500 w. Eng News-Rec—May 30, 1918. Methods of Santa Fe in handling stores at Topeka shops.

Hauling Eggs by Truck (86649 A). 1800 w. Com Vhle—June 1, 1918. Haulage from Vineland, N. J., to New York City.

The Economy of Centralized Trucking (84570 A). J. M. Van Harlingen. Ills. 2500 w. Ind Man—March, 1918. Increased production and reduction in cost by use of electric trucks.

Connecticut Establishes First Statewide Return Loads Bureau (84868 A). Joseph Husson. Ills. 1700 w. Com Vhle—March 1, 1918. Work proves a success. Roads cleaned of snow.

Cleveland Overland Truck Haulage Concern Serves Sandusky, Akron and Canton (85455 A). Ills. 2500 w. Com Vhle—April 1, 1918. Account of service rendered.

Motor Truck Rural Express Routes in Maryland Increase Vital Food Production (85458 A). Ills. 2000 w. Com Vhle—April 1, 1918. Twenty-three routes, with thirty-one vehicles in use.

Growth of Return Loads Bureaus Requires a Government Director (86073 A). Map. 3000 w. Com Vhle—May 1, 1918. The need and requirements.

Truck Motor

Manufacturing Operations in Making a Gasoline Motor (83346). Ills. 1200 w. Am Mach—Jan. 3, 1918. Methods used in making and testing a four-cylinder truck motor.

Truck Operation

The Advantages of a Standard System for Recording Truck Operating Costs (87045). S. V. Norton. 1500 w. Eng & Con—June 19, 1918. Abstract of a recent article on features of a standard system.

Truck Repairs

Great Baltimore Quartermaster Depot Repairs Trucks on Standardized Plan (86919 A). Ills. 1000 w. Com Vhle—June 15, 1918. Constructed for training men in maintenance work. Every repair done by manual.

AUTOMOBILES

Water Injection

Trucks

Unusual Material in Riker Truck (82-325). Ills. 2000 w. Auto Ind—Nov. 8, 1917. Special steels used. Cost a secondary consideration.

Complete Design of Class AA Truck (83122). 1500 w. Auto Ind—Dec. 20, 1917. Features of the new design.

Europe's Aviation Truck Design (83-250). W. F. Bradley. Ills. 1500 w. Auto Ind—Dec. 27, 1917. Types and requirements.

Industrial Trucks in Freight Congestion Relief (83143). F. C. Myers. Ills. 1500 w. Elec Wld—Dec. 22, 1917. Advantages from use of electrically propelled carriers.

New Electric Truck Service Ready in Chicago (83276). Ills. 3500 w. Elec Rev, Chi—Dec. 29, 1917. New station with complete garage and maintenance service.

Applying Engineering Principles in the Design of Trucks (87660). Norman Litchfield. 1800 w. Elec Ry J1—July 20, 1918. Points on truck loading and the mechanical functions of the parts.

Trucks Give Express Service Between Cleveland and Akron (87441 A). Joseph Husson. Ills. 4000 w. Com Vhle—July 1, 1918. Service quicker and cheaper than railroad.

Transportation by Power Trucks (87739 A). Reginald Trautschold. Ills. 4000 w. Ind Man—Aug., 1918. How demands of industry have increased the use of storage-battery trucks. Types, power costs, etc.

Truck Operating and Maintenance Costs in New York City (87646 A). Ills. 1500 w. Com Vhle—July 15, 1918. Goodman's system produces high grade performance.

Distribution of Truck Weights (87523). P. M. Heldt. 1700 w. Auto Ind—July 11, 1918. Analysis of the weights of component parts, worked out on a percentage basis, and showing variation with truck capacity.

See also Motor Post, under Civil Engineering, Roads and Pavements.

Freight Being Hauled Successfully Between New York and Philadelphia by Trucks (83677 A). Ills. 3000 w. Com Vhle—Jan. 15, 1918. 104-mile run daily on schedule time.

More Efficient Co-operation Delivery Demanded by War Conditions (83391 A). 3500 w. Com Vhle—Jan. 1, 1918. Shows that co-operative delivery by trucks cuts food costs and releases men for vital work.

Motor-Truck Transportation (83330 A). William P. Kennedy. 2500 w. A S

M E, J1—Jan., 1918. Developments to be expected to meet war necessities.

Three Class A 1½-Ton Q. M. C. Trucks Completed and on Way to Washington for Tests (83393 A). Ills. 1000 w. Com Vhle—Jan. 1, 1918. Characteristics.

War Conditions and Importance of Food Supply Forcing Farmers to Buy Trucks (83490 A). Ills. 3500 w. Com Vhle—Jan. 1, 1918. Labor shortage and railroad congestion help sales.

Opposition to Standardized Trucks (84682). 1500 w. Auto Ind—Feb. 28, 1918. Convincing arguments advanced by both sides.

Trucks for Overland Hauls as Seen from Goodyear Experiences (84870 A). Ills. 1800 w. Com Vhle—March 1, 1918. New Features of latest design.

Truck Service

Trucks Prove Best Means of Transportation in City and Rural Mail Service (85002 A). 1500 w. Com Vhle—March 15, 1918. From report of Postmaster Burleson comparing commercial vehicles with other conveyances.

Twice-a-Week Truck Service from Boston to New York (85001 A). Ills. 1200 w. Com Vhle—March 15, 1918. Two 5-ton trucks run each way every week.

Truck Wheels

Making Cast Steel Wheels for U. S. Army Trucks (88564). Ills. 3500 w. Fndry—Sept., 1918. How increased output was met by the Dayton Steel Foundry Co.

Mine Quantity Production Made Possible by California Motor Trucks (88547 A). John Grant. Ills. 3000 w. Com Vhle—Sept. 1, 1918. Details of work accomplished by motor trucks.

Seven Trucks Replace Seventeen Horses Hauling Express Matter from Newark to New York (88550 A). Ills. 1500 w. Com Vhle—Sept. 1, 1918. Work of Leuddeke's Express Co. on 12-mile haul.

See also same heading under INDUSTRIAL MANAGEMENT, Management.

Universal Joints

Flexible Fabric Universal Joints (85375 B). C. A. Schell, with discussion. Ills. 5000 w. S A E, J1—March, 1918. Construction, use, etc.

Vaporization

Pre-heating the Air (85243 A). W. C. F. Redmond. Ills. 1000 w. Autocar—March 9, 1918. Effect upon fuel consumption of increasing the carburettor air temperature. Report of tests.

Water Injection

Water Injection May Increase Power (82468). J. Edward Schipper. 1200 w. Auto Ind—Nov. 15, 1917. With kerosene,

Wheels

fuel and certain speeds water injection permits more spark advance, hence gives more power. See also page 213.

Wheels

The Hayter Road Wheel (83353 A). Ills. 1500 w. Autocar—Dec. 15, 1917. A construction which reduces the trouble of changing a pneumatic tire.

The Rapid Detachable Wheel (83746 A). Ills. 3000 w. Autocar—Jan. 5, 1918. Claims a locking mechanism en-

COMBUSTION MOTORS**Engines**

ables a wheel to be detached or refitted in less than four seconds.

A Century of Wheels (85241 A). Charles G. Harper. Ills. 1200 w. Autocar—March 2, 1918. Facts concerning the earlier development of tires and springs.

Women Drivers

Women Drivers and Service Cars (85516 A). Ills. 1500 w. Autocar—March 16, 1918. Details of the work performed.

COMBUSTION MOTORS**Cooling**

New Method of Cooling Gas Engines (89493). 2000 w. Pwr Pt Eng—Oct. 15, 1918. Method of internal injection of water. See also pages 213, 220.

Diesel Engines

The Diesel Engine; Its Fuels and Its Uses (89105 A). Herbert Haas. Ills. 122 pp. U S Bur Mines—Bul 156. Discusses recent developments in the design and construction, the fuels suitable for burning in it, and its special uses.

Automatic Control of Blast Pressure for Diesel Engines (82831 A). Herbert S. Russell. Abstract of paper before the Diesel Engine Users' Ass'n. Ills. 1200 w. Elec Rev—Nov. 16, 1917. Devices for controlling the air pressure.

Light Diesel Engine Possible (83251). Cole Newman. 1500 w. Auto Ind—Dec. 27, 1917. Suggests a modified cycle combined with compound expansion.

Elements of Diesel Engine Design (88048 B). W. G. G. Gordon. Ills. 3 pp. S A E, JI—Aug., 1918. The principle of operation.

Four-Cycle versus Two-Cycle Diesel Engines (87764 A). 1800 w. Engng—June 28, 1918. Discusses both types and results obtained, favoring the four-cycle.

Werkspoor Marine Diesel Engines (87360 A). Ills. & Plate. 1600 w. Engng—June 5, 1918. Serial, 1st part. Detailed description.

Development of the Diesel Type Marine Heavy Oil Engine in the United States (85589 A). George A. Colley. 2500 w. Int Mar Eng—April, 1918. A resumé of what has been accomplished and what is necessary to compete with steam.

Engines

The Increasing of Power Output (89275). Emil Schimanek. Ills. 4000 w. A A Wkly—Oct. 7, 1918. Ways of increasing output, including reference to a 6-stroke engine.

High Speed Internal Combustion Engines (86698 N). Harry R. Ricardo. Ills. 44 pp. N E C Instn—April 30, 1918. Features of high-speed engine design and points on which designers have concentrated attention.

Oil Engines (87020). Ills. 1400 w. Pwr Pt Eng—June 15, 1918. Serial, 1st part. Principles of operation, characteristics and efficiencies.

The Heavy Oil Engine (86803 A). Charles E. Lucke. 12000 w. E Cb Phila, JI—June, 1918. Development to the present time and reasons for believing a change is about to take place.

Internal Combustion Engine Design (86714 A). Jas. Dunlap. 1500 w. Mech Wld—May 10, 1918. Method of estimating or calculating quantities, thus eliminating guesswork.

A Type of Heavy-Oil Engine for Automotive Purposes (87298 A). C. E. Sargent. Ills. 3500 w. S A E, JI—June, 1918. Describes a constant-compression engine of the gravity-feed type and its performance.

Possible Automotive Adaptations of Heavy-Oil Engines (87297 A). P. L. Scott. Ills. 3500 w. S A E, JI—June, 1918. Discusses the more extended and more economic use of hydrocarbon oils and the mechanical and thermal problems.

The Semi-Diesel Oil Engine (87426). L. H. Morrison. Ills. 2000 w. Power—July 9, 1918. Some semi-Diesel engines are similar in appearance to low-compression oil engines.

Some Features of Low Compression Oil Engines (87753). L. H. Morrison. Ills. 4000 w. Power—July 23, 1918. Serial, 1st part. Reviews the principles of the two-stroke cycle type.

Frost Precautions for Internal Combustion Engines (84670 A). 2000 w. Mech Wld—Feb. 8, 1918. Methods suggested for water-cooled types. See also p. 211.

HEATING AND COOLING

Air Conditioning

Fuels

Alcohol as a Source of Power (83077 A). W. T. Rowe. 3000 w. Engr—Nov. 30, 1917. Its use as a fuel for internal combustion engines; sources of alcohol and cost of production.

Gas Engines

Gas-Engine Work on the Pacific Coast (88324 A). Frank A. Stanley. Ills. 2500 w. Am Mach—Aug. 22, 1918. Boring, milling, turning, etc.

Augustine Rotary Two-Cycle Super-Induction Gas Engine (86796). Ills. 2500 w. Power—June 11, 1918. Detailed description of this new design.

Large Three-Crank Double-Acting Gas Engine (86835 A). Ills. 1000 w. Engr—May 24, 1918. Largest engine of its type yet constructed; built by the British Westinghouse Co.

The Multi-cylinder Gas Engine in Its Modern Development (85257 A). Ills. 1300 w. Mech Wld—March 8, 1918. Advantages of the enclosed type.

Gas Engine Troubles and Remedies (83829). A. L. Brennan, Jr. 1200 w. Power—Jan. 29, 1918. How to diagnose troubles and apply proper remedies.

Gas Furnaces See also page 240.

Gas Furnaces: Their Design and Manipulation (82830 A). Arthur Forshaw. Read before Manchester Dist. Jun. Gas Assn. 7500 w. Engng—Nov. 16, 1917. Serial, 1st part. Types of furnaces and processes in use, etc.

Ignition

Magneto vs. Battery Ignition (84308). J. B. Williams. Ills. 4500 w. A A Wkly—Feb. 18, 1918. Discusses the two systems.

Troubles and Their Remedies in Gas-Engine Ignition Systems (84368). A. L. Brennan, Jr. 2000 w. Power—Feb. 19, 1918. How to locate and correct various troubles.

Lubrication

Internal-Combustion Engine: Lubrication and Lubricants (86908 N). P. H. Conradson. 5 pp. Am Soc Test Mat—June, 1918. Essential factors to be considered in the selection of lubricants, and method of applying.

Marine Engines

Motori A Combustione Marini A Due Ed A Quattro Tempi (89713 C + D). G. Chiesa. Ills. 4400 w. Rivista Marittima—Aug., 1918. Two and four-stroke cycle motors for marine service.

Internal-Combustion Engines for Submarines and Aircraft (89532 A). 1800 w. Engng—Sept. 20, 1918. Editorial on points of difference in regard to weight per unit of power.

See same heading under Marine and Naval Engineering.

Oil Engines

Heavy Oil Engine Developed in Europe (88830). Ills. 1500 w. Mar Eng, Can—Aug., 1918. A marine engine known as the Kromhout. Automatic starting, stopping, and reversing.

Oil Engines (82744). 1500 w. Pwr Pt Eng—Dec. 1, 1917. Points relating to their operation.

Buckeye-Barrett Oil Engines (88120). Ills. 1500 w. Power—Aug. 13, 1918. A heavy-duty horizontal two-stroke-cycle, semi-Diesel engine using a crosshead for operating on low-grade fuel oils.

Rational Design for an Oil Engine (87828 A). John F. Wentworth. Read before Soc. Nav. Archts. & Mar. Engrs. Ills. 10800 w. Mar Rev—Aug., 1918. Low compression pressures advocated and steam recommended for starting.

Producer Gas

Producer Gas, Its Manufacture and Use (88370 B). C. S. Palmer, with discussion. 33 pp. Engrs Soc W Penn, Pro—May, 1918. History of development.

Thermodynamics

Thermodynamic Cycles in Internal Combustion Engines (89148). William J. Walker. Ills. 3500 w. A A Wkly—Sept. 30, 1918. With particular reference to aircraft requirements. Methods by which increase of power may be obtained.

Waste Heat

Saving Waste Heat from Gas and Oil Engines (86652). Charles L. Hubbard. Ills. 2500 w. Pwr Pt Eng—June 1, 1918. Methods of utilizing gases to heat water in radiators, heaters and boilers.

HEATING AND COOLING

Air Conditioning

A Constant Temperature and Humidity Room for the Testing of Paper, Textiles, etc. (83608 B). F. P. Veitch and E. O. Reed. Ills. 4000 w. J1 Ind & Eng Chem—Jan., 1918. Control of humidity in industries.

Apparatus for Cooling, Drying and Purifying Air (82705 A). W. J. Baldwin. Ills. 1200 w. A S M E, J1—Dec., 1917. Details of the device and its uses.

Effect of Air Conditioning Upon Munitions Manufacture (82461 D). J. Ir-

Air Conditions

vine Lyle. Ills. 10 pp. Am Soc Ht & Vt Engrs, J1—Oct., 1917. Presidential address. Describes process of timing fuse for shrapnell shells.

Dry Air and Cold Steam (86654). Frank Richards. 1000 w. Pwr Pt Eng—June 1, 1918. Relation of vapor and air in saturated mixture to temperatures and pressure

Air Conditions

Report on Air Conditions at the Paris Garter Factory (86423). Ills. 2200 w. Ht & Vtg Mag—May, 1918. Serial, 1st part. Details of a Chicago building, the ventilating system tests, etc.

Air Heaters

Air Heater for Motor Car Carbureters (83079 A). Ills. 1000 w. Engr—Nov. 30, 1917. Details of types of "Calo" air heaters.

Air Tests

Test of Air Conditions in the Wholesale Tailoring Establishment of the John Gorman Company (85718). John Howatt. Ills. 2500 w. Ht & Vtg Mag—April, 1918. Explains conditions of a shop in Chicago, giving results of tests.

Air Washers

A High-Speed Air and Gas Washer (86194 A). John L. Alden. (Abstract.) Ills. 2000 w. A S M E, J1—May, 1918. A new type offering advantages over existing types.

Report of Committee on Standard Method of Testing Air Washers (82463 D). 1200 w. Am Soc Ht & Vt Engrs, J1—Oct., 1917.

Ammonia

The Solubility of Ammonia (88002 A). M. J. Eichhorn. Tables & Diagrams. 4500 w. Ice & Refrig—Aug., 1918. Former researches and existing data.

Latent Heat of Vaporization of Ammonia (87563 A). Nathan S. Osborne and Milton S. Van Dusen. 34 pp. U S Bur Stds—June 24, 1918. Describes apparatus and method; theory of method, experimental details and results.

Specific Heat of Liquid Ammonia (87561 A). Nathan S. Osborne and Milton S. Van Dusen. 35 pp. U S Bur Stds—June 24, 1918. Description of apparatus and methods used, with results.

The Latent Heat of Pressure Variation of Liquid Ammonia (87562 A). Nathan S. Osborne and Milton S. Van Dusen. 5 pp. U S Bur Stds—June 24, 1918. Determined by direct calorimetric observations and by computation from the expansivity.

Conservation of Ammonia (85991). A. G. Solomon. Ills. 2000 w. Pwr Pt

HEATING AND COOLING**Cold Storage**

Eng—May 1, 1918. Serial, 1st part. Advice on the prevention of loss.

Ammonia Compressor

A Five-Hundred-Ton, High-Speed, Booster Ammonia Compressor (82-808 B). F. L. Fairbanks, with discussion. 3500 w. A S R E, J1—Nov., 1917.

Bogasse

See same heading under **MECHANICAL ENGINEERING, Steam Engineering.**

Camp Heating

The Heating Equipment for a Great Military Camp (83109). Ills. 1200 w. Ht & Vtg Mag—Dec., 1917. Details of the installation at Camp Upton, Yaphank, L. I.

Cantonments

For Soldiers in the Making (83669). Ills. 2500 w. Pr Pt Eng—Jan. 15, 1918. Refrigerating and ice making, water and heating plants installed at Rockford.

Central Heating

Inorichtingen voor Centrale verwarming, warmwatervoorziening en Stoomlevering (89050 B). J. Mantel. Ills. 3200 w. Ingenieur—July 6, 1918. Central heating, warm water and steam supply at a large insane asylum at Woensel, Holland.

Central Station Heating in Detroit (86091). J. H. Walker. Ills. 2500 w. Power—May 7, 1918. Features of the live-steam heating plants and system of the Detroit Edison Co.

Inside Data on Central Station Heating (87020). W. H. Frehsee. 3000 w. Heat & Vent Mag—June, 1918. Practical points covering heating mains, fittings, street steam traps, service connections, etc

Coal Requirements

Coal Required for Heating (88487). William Ehrlich. 2000 w. Pwr Pt Eng—Sept. 1, 1918. Methods of predetermining coal requirements based on the average temperatures and modern equipment.

Coal Waste

Heat Leakage Wastes Coal (88445 A). Austen Bolam. 1000 w. Ind Man—Sept., 1918. Losses from poorly insulated steam pipes shown.

Cold Storage

Simple Design Marks Cold Storage Building for Apples (87013). Stewart T. Smith. Ills. 1200 w. Eng News-Rec—June 20, 1918. Reinforced-concrete frame and flat-slab floors with hollow tile walls separated by cork insulation.

Cold Storage In London (87156). 1400 w. Times Engng Supp—May, 1918. Warehouse recently built in London. Details of construction and of refrigerating plant.

Comfort Tests

Extra and Special Service by Cold Storage Warehouses (83576 A). F. M. Shoemaker. 2500 w. Ice & Refrig—Jan., 1918.

Multi-Stage Compression Plant of Central Cold Storage Co. (83583). Ills. 2500 w. Power—Jan. 15, 1918. Details of a modern two-unit ammonia plant of 500 tons refrigerating capacity employing new D. I. Davis system of multi-stage compression.

Science and the Cold Storage Industry (83632 A). J. Wemyss Anderson, with discussion. 5000 w. Roy Soc Arts, JI—Dec. 21, 1917. Need of research work in England. Weak points and methods of strengthening them.

Comfort Tests

A Study of Degrees of Discomfort (88219). Chart. 1000 w. Ht & Vt Mag—Aug., 1918. Based on temperature comfort tests made at the Chicago Normal College by Prof. J. W. Shepherd.

Combustion

Burning Bituminous Coal in House-Heating Boilers (88069). W. A. Pittsford. Ills. 1600 w. Ht & Vt Mag—Sept., 1918. From address before Smoke Prevention Assn. The mixing of oxygen with the combustible the important factor.

Cooling Systems

See same heading under Steam Engineering.

Cost

Meeting the High Cost of Heating and Ventilating Apparatus (85051). Ills. 3000 w. Heat & Vent Mag—March, 1918. With suggestions for proposed system to reduce cost of installation and operation.

Cost Study

Meeting the High Cost of Heating and Ventilating Apparatus (88221). George T. Mott. Ills. 3000 w. Ht & Vt Mag—Aug., 1918. Discussion based on an article advocating the use of pipe coils as an economy measure.

Development in Heating and Ventilation During the Past Five Decades (88220). Werner Nygren, in *Record and Guide*. 2200 w. Ht & Vt Mag—Aug., 1918. Review of advances.

Dehydration

Address on Dehydration (82464 D). H. C. Gore, with discussion. 18 pp. Am Soc Ht & Vt Engrs, JI—Oct., 1917. Methods and results.

Drying

High Temperature Drying (83950 D). Burt S. Harrison. 14 pp. Am Soc Ht & Vt Engrs, JI—Jan., 1918. Evaporation; design of high temperature installation. Air heating to high temperature.

Address on Dehydration (86512 D). H. C. Gore, with discussion. 3000 w.

HEATING AND COOLING

Fuel

Am Soc Ht & Vt Engrs, JI—April, 1918. Important points in conserving the food supply by drying.

Food Dryers and the Use of School Houses for Drying (86449 D). W. L. Fleischer. Ills. 15 pp. Am Soc Ht & Vt Engrs, JI—April, 1918. Information concerning methods and food values.

Electric Heat

Low-Temperature Industrial Heating (84055). Dwight D. Miller. Ills. 3000 w. Elec Rev, Chi—Feb. 2, 1918. Serial, 1st part. On electric heat for baking, japanning, and similar industrial uses.

Enameling Ovens

Heat Calculations for Baking and Drying Ovens (82178). Wirt S. Scott. Ills. 1500 w. Elec JI—Nov., 1917. Cost of coal, gas and electricity compared, advantages of electricity, etc.

Equipment

Care of Heating and Ventilating Equipment (88672). Harold L. Alt. 1200 w. Power—Sept. 10, 1918. Serial, 1st part. On the economical operation.

Heating and Ventilating Equipment as Realty Fixtures (88222). Arthur L. H. Street. 2000 w. Ht & Vt Mag—Aug., 1918. Summary of Court decisions on the removable character of such appliances as against adverse claimants.

Evaporation

A New System of Regenerative Evaporation (88557 A). William L. De Baufre. Ills. 3000 w. A S M E, JI—Sept., 1918. Brief description of the system with tests.

Some General Aspects of Evaporation and Drying (84071 A). Hugh K. Moore. 4500 w. Met & Chem Eng—Feb. 1, 1918. Serial, 1st part. General theory and practice.

Some Problems in Evaporation and Drying (86307 A). P. B. Sadtler and F. M. de Beers. 2000 w. Met & Chem Eng—May 15, 1918. Abstract of paper before Am Inst of Chem. Engrs. Design of evaporators.

The Temperature of Evaporation—Its Practical Application to Air Conditioning and to the Drying and Conditioning of Materials (83951 D). W. H. Carrier. 21 pp. Am Soc Ht & Vt Engrs, JI—Jan., 1918. Wet bulb temperatures and the laws governing it, giving formulae, and discussing its bearing on air conditioning.

Fuel

Possibilities of the Relief of Fuel Consumption in Canadian Industry by the Increased Use of Hydroelectric Energy (85365). J. M. Robertson. 2500 w. Can Engr—March 28, 1918. Read before Can. Soc. of Civ. Engrs.

Fuel Conservation**HEATING AND COOLING****Heat Transfer**

The Gas Industry and Canada's Fuel Problem (85364). Arthur Hewitt. 2500 w. Can Engr—March 28, 1918. Abstract from paper before Can. Soc. of Civ. Engrs. Gas as fuel for industrial purposes.

Address on Fuel Conservation (86,514 D). George W. Martin, with discussion. Ills. 4000 w. Am Soc Ht & Vtg Engrs, JI—April, 1918. The use of forced draft with low grade fuels. Change from isolated plant to central station service.

Address on Fuel Conservation (86,513 D). L. P. Breckenridge, with discussion. 2500 w. Am Soc Ht & Vtg Engrs, JI—April, 1918. Production, distribution, use, and economy.

Burning Soft Coal in Heaters Designed for Hard Coal (88968). 1100 w. Ht & Vt Mag—Sept., 1918. Suggestions prepared by William H. Reid for house heating.

Fuels

Utilizing the Heat in a Pound of Coal (83843). Harold L. Alt. 2000 w. Ht & Vtg Mag—Jan., 1918. Analysis of the relation between heating and mechanical equipment from fuel standpoint.

Fuel Saving

Fuel Saving in Household Heating (84173 A). Robert E. Dillon. Ills. 3000 w. Gen Elec Rev—Feb., 1918. Urges efficient management of domestic heating plants.

Furnace Heating

Furnace Heating Engineers' Opportunity (86511 D). D. Rait Richardson. 2200 w. Am Soc Ht & Vtg Engrs, JI—April, 1918. The commercial side of warm air furnace business.

The Engineering of Warm-Air Furnace Heating (86510 D). M. William Ehrlich, with discussion. Ills. 20 pp. Am Soc Ht & Vtg Engrs, JI—April, 1918. Rules and recommendations for installing and operating.

Gas Heating

Appareils, Système Ionidès, Pour Le Chauffage Au Gaz (83945 B). Ills. 1200 w. Le Génie Civil—Dec. 15, 1917. The Ionidès apparatus for gas furnaces, dryers, etc.

Heat Control

Report on Automatic Heat Control (86690 A). 500 w. Ind Man—Nov., 1918. Report of the Committee of Am. Soc. of Heating and Ventilating Engineers.

Heat Flow

A New Principle in the Flow of Heat (83883 B). Carl Hering. 2200 w. Fkn Inst, JI—Jan., 1918. Research work.

Heating

Answering Fuel Needs with a New Heating System (83957 D). George S. Barrows. Ills. 14 pp. Am Soc Ht & Vt Engrs, JI—Jan., 1918. Details of the G. F. E. Rector system of gas heating.

What We Do and Don't Know About Heating (83954 D). John R. Allen. 2500 w. Am Soc Ht & Vt Engrs, JI—Jan., 1918. Heat laws; heat losses from buildings; infiltration; radiation, etc.

Economy in Heating (86509 D). Konrad Meier. 10 pp. Am Soc Ht & Vtg Engrs, JI—April 1918. The requirements, production and application of heat.

Heating Boilers

Unstable Water Lines in Heating Boilers (85986). Charles L. Hubbard. Ills. 3000 w. Pwr Pt Eng—May 1, 1918. Causes and remedies.

Heating Demand

Average and Maximum Heating Demand (84719). M. W. Ehrlich. 1800 w. Power—March 5, 1918. Method of computing the coal consumption.

Heating Dwellings

How 20 Per Cent. of the Cost of Heating Buildings Can Be Saved (85299). 800 w. Eng & Con—March 27, 1918. Suggestions sent by the Colo. State Council of Defense to householders for the proper use of coal.

Heat Insulation

Evolution of Heat Insulation (86651): Austen Bolam. 2000 w. Pwr Pt Eng—June 1, 1918. Materials tried, combinations, test results, and present practice.

Watch Your Radiation Losses to Help Save Coal (85004). Austen Bolam. Ills. 1800 w. Elec Wld—March 16, 1918. Heat losses from insulated surfaces. Discusses heat insulation from viewpoint of investment.

Heating Systems

Reasons for Failures of Heating Systems (87609 D). J. D. Hoffman. 10 pp. Am Soc Ht & Vt Engrs, JI—July, 1918. Faults of construction in house building; wrong ideas in regard to ventilation, etc.

Heat Transfer

Heat Transfer from Air to Pipes (82899 B). Charles H. Herter, with discussion. Ills. 6000 w. A S R E, JI—Nov., 1917. Investigations of heat transfer problems.

The Transfer of Heat Between a Flowing Gas and a Containing Flue (82923 A). Lawford H. Fry. 32 pp. A S M E—Dec., 1917. Formula with description.

HEATING AND COOLING

Industrial Buildings

Heat Transmission

New Heat Transmission Tables (89638). William R. Jones. 5 pp. *Ht & Vtg Mag*—Oct., 1918. Serial, 1st part. A remarkable compilation of factors as given by leading authorities covering latest types of construction.

The Heat Transmission of Standard Building Materials (87607 D). A. C. Willard. 10 pp. *Am Soc Ht & Vt Engrs*, JI—July, 1918. Results of tests made at the Engineering Experiment Station of the University of Illinois.

Some Recent Studies in Heat Transmission (86815 B). Arthur J. Wood and Roy B. Fehr, with discussion. *Ills.* 40 pp. *A S R E* JI—March, 1918. Studies aiming to establish constants applicable to practical engineering problems.

High Temperatures

High Temperature Processes and Products. (88903 A). Charles R. Darling. Cantor lecture. *Ills.* 4000 w. *Roy Soc Arts*, JI—Aug. 23, 1918. Serial, 1st part. Conditions affecting the production of high temperatures, and successful methods of practical utility and their uses.

Hospitals

Heating a Base Hospital (87610 D). Presly M. O'Connell. *Ills.* 1000 w. *Am Soc Ht & Vt Engrs*, JI—July, 1918. Details of plant at Camp Dodge hospital, Des Moines, Iowa.

Hot-Air Plants

Reforms in the Design of Hot-Air Heating Plants Needed to Compete with Other Systems (87612 D). Charles Whiting Baker. 10 pp. *Am Soc Ht & Vt Engrs*, JI—July, 1918. Gives reasons why a hot-air heating plant, properly installed, in a building of moderate size, has advantages over either steam or hot water.

Hot Water

Relation of Hot Water Service Heating to Various Types of Buildings (83953 D). Harold L. Alt. 2500 w. *Am Soc of Ht & Vt Engrs*, JI—Jan., 1918. Data of use in computing the amount required and steam or coal calculations.

Domestic Hot-Water Supply Systems (82891). *Ills.* 2000 w. *Trav Stand*—Dec., 1917. Systems used and necessary precautions.

Calculations and Analysis of a Compound Gravity Low-Pressure Hot Water System (82459 D). A. J. Wells. 21 pp. *Am Soc Ht & Vt Engrs*, JI—Oct., 1917.

Gli Impianti Di Riscaldamento A Circolazione Accelerate (82695 B). M. Lombardi. *Ills.* 1500 w. *Industria*—

Oct. 21, 1917. House heating plant with forced circulation. Tests.

Hot-Water Heating

Standards of Central Station Hot Water Heating Service (86637). 2500 w. *Ht & Vtg Mag*—Oct., 1918. Esetablished by the Public Service Commission of Indiana under date of Aug. 3, 1918.

Hot-Water Service (87019). M. W. Ehrlich. *Ills.* 2200 w. *Pwr Pt Eng*—June 15, 1918. Method of calculating the required heating surface.

Hot Water Pipe

The Preservation of Hot Water Supply Pipe in Theory and Practice (83952 D). F. N. Speller and R. G. Knowland. *Ills.* 3500 w. *Am Soc Ht & Vt Engrs*, JI—Jan., 1918. Principles of corrosion as applying to hot water supply systems.

House Heating

A Campaign for Fuel Economy in House Heating (87611 D). Charles Whiting Baker. 1200 w. *Am Soc Ht & Vt Engrs*, JI—July, 1918. Recommends the addition of an auxiliary cold air duct by which the air supply to the furnace may be taken from inside.

Ice

Preventing Red Core (86126 A). Louis Block. *Ills.* 1400 w. *Ice & Refrig*—May, 1918. Causes and prevention.

Ice Making

Treatment of Water for Raw Water Ice Making (88292 B). M. F. Newman, with discussion. 13 pp. *A S R E*, JI—May, 1918. Essentials of water purification. See also *Refrigeration*, page 128.

Ice Plant

Modern Raw Water Ice Making Plant (87378 A). *Ills.* 2000 w. *Ice & Refrig*—July, 1918. A new 100-ton plant in Chicago, with up-to-date equipment.

Sixty Ton Electrically Operated Raw Water Ice Plant (87204). W. G. Walters. *Ills.* 1500 w. *Pwr House*—June, 1918. Details of London, Ont., plant.

Modern Stationary Can Raw Water Ice Plant (88685 A). *Ills.* 4000 w. *Ice & Refrig*—Sept., 1918. Details of plans and equipment of a plant at Canton, Ohio.

The Electrically Operated Ice Plant (82897 B). H. Sloan, with discussion. 28 pp. *A S R E*, JI—Nov., 1917. The development; the problem of obtaining a well-balanced plant, etc. See same heading on page 126.

Industrial Buildings

Heating of Industrial Buildings (83135 A). *Ills.* 500 w. *Engr*—Dec. 7, 1917. Describes the "Industria" air heater.

Laundries

Heating and Ventilating of Loft Buildings (82745). Charles L. Hubbard. Ills. 4000 w. Natl Engr—Dec., 1917. Chief features of equipment described and service demands computed.

Laundries

Machine Laundries (86483). 1000 w. Times Engn Supp—April 26, 1918. Machinery and equipment for washing, drying, etc., in hospitals and munition works.

Liquid Oxygen

Explosif A Oxygène Liquide (87710 B). Ills. 3600 w. Génie Civil—June 1, 1918. Use of liquid oxygen as explosive in the mines of Germany.

Mine Ventilation

Ventilation of Mines (87606 D). Thomas Chester. Ills. 15 pp. Am Soc Ht & Vt Engrs, JI—July, 1918. Deals with methods of ventilation, effects, etc.

Refrigeration See also page 193.

Gas Formation in Ammonia Absorption Refrigerating Machines, Its Causes and Remedy (86814 B). E. C. McKelvy and A. Isaacs, with discussion. Ills. 17 pp. A S R E JI—March, 1918. Experimental work and results.

Horsepower Per Ton of Refrigeration (86961 A). Eric H. Peterson. 700 w. Ice & Refrig—June, 1918. Considers the horsepower of motor and compressor.

Purging Ammonia Condensers (86672). Thomas G. Thurston. Ills. 3500 w. Natl Engr—June, 1918. How to purge the air with a minimum loss of ammonia.

Refrigeration in the Packing House Industry (89385). W. F. Sutherland. Ills. 2800 w. Pr House—Sept., 1918. New equipment aids in handling of products. See *Warehouse*, page 229.

Refrigerating Plant, Intermediate Depot for American Army in France (89664). Robert K. Tomlin, Jr. Ills. 1500 w. Power—Oct. 22, 1918. Plant built by army men to care for the storage of 5000 tons of meat.

Throttling of Ammonia (89305). Charles H. Herter. 1000 w. Power—Oct. 8, 1918. Concludes that intermediate throttling of liquid is proper under certain conditions.

Refrigeration and Ice Making (87742 A). Charles L. Hubbard. Ills. 2500 w. Ind Man—Aug., 1918. Adaptability to military camps and shipboard outfits.

Nouvelles Applications Du Froid Artificiel (87709 B). A. Fichet. Ills. 2500 w. Génie Civil—June 1, 1918. Portable refrigerating outfits, especially those for military use.

Refrigerating Economies (88491). Peter Neff. 1700 w. Pwr Pt Eng—Sept. 1, 1918.

HEATING AND COOLING

Refrigeration

How to locate and stop losses in compressor room, pipe lines, and cooling rooms.

Engineering in the Dairy Industry (83999). Ills. 1500 w. Pwr Pt Eng—Feb. 1, 1918. Refrigerated air employed.

Latent Heat of Vaporization of Ammonia (84168). Nathan S. Osborne and Milton S. Van Dusen. 30 pp. U S Bur Stds, No. 315—Dec. 21, 1917. Describes calorimeter designed for latent heat.

Specific Heat of Liquid Ammonia (84166). Nathan S. Osborne and Milton S. Van Dusen. 44 pp. U S Bur Stds, No. 313—Dec. 13, 1917. Data of importance to refrigerating engineers.

The Absorption Refrigerating Machine (84003). W. L. Myer. Ills. 1200 w. Pwr Pt Eng—Feb., 1918. Parts of the system and their functions.

The Latent Heat of Pressure Variation of Liquid Ammonia (84167). 1500 w. U S Bur Stds, No. 314—Nov. 16, 1917. Results of research.

Mechanical Refrigeration (84640). 4500 w. Natl Engr—March, 1918. Various refrigerating mediums and how used.

Relation Between Efficiency of Refrigerating Plants and the Purity of Their Ammonia Charge (84763 B). F. W. Frerichs. Ills. 8000 w. JI Ind & Eng Chem—March, 1918. Apparatus and experiments.

The Economy of a Refrigerating Power Plant (84909 A). Victor J. Azbe. 3500 w. E Cb St L, JI—Jan.-Feb., 1918. Study of losses.

The Selection of Ammonia Condensers (84851). M. A. Saller. 1700 w. Power—March 12, 1918. Acquaints the engineer with the chief factors.

Cold Accumulators and Their Application to the Refrigerating Industry (88293 B). Ernst S. H. Baars. Ills. 9 pp. A S R E, JI—May, 1918. Describes hold-over tanks for keeping the low temperature from the time the refrigerating plant is shut down until it is started again.

Suction Gas Forecoolers (84807 A). Geo. J. Prosper. 2000 w. Ice & Refrig—March, 1918. Superheated suction gas lowers capacity and efficiency of compressor. Types and their operation.

The Practical Side of the Low Temperature Compression System (88294 B). H. Sloan, with discussion. Ills. 12 pp. A S R E, JI—May, 1918. Details of successful installations.

The Machinery of Refrigeration (85849 A). Charles L. Hubbard. Ills. 3000 w. Ind Man—May, 1918. Principles of refrigeration; systems in use; power required, applications, etc.

Refrigerating Machines HEATING AND COOLING

Temperatures

Comparative Merits of Refrigerating Systems (85390). 7000 w. Natl Engr—April, 1918. Discussion on the relative merits of the absorption and compression methods of mechanical refrigeration by operating engineers in New York City.

Economy of the Refrigeration Power Plant (85311 B). Victor J. Azbe. Curves. 20 pp. A S R E, J1—Jan., 1918. A study of gains and losses.

Heat Balance of the Ammonia Compression System (85310 B). J. H. H. Voss, with discussion. Ills. 22 pp. A S R E, J1—Jan., 1918. Discusses the three values for determining the economy of the ammonia compression system.

Synchronous Motors for Driving Ammonia Compressors (85312 B). Truman Hibbard. 2800 w. A S R E, J1—Jan., 1918. Advantages as compared with the induction motor.

Carbonic Acid Refrigerating Machines (86127 A). J. C. Goosmann. 2000 w. Ice & Refrig—May, 1918. Some of the conditions that have delayed their adoption.

Conservation of Ammonia and Coal (86125 A). Edward N. Friedmann and Van R. H. Greene. 2000 w. Ice & Refrig—May, 1918. Losses and improvements.

Overhauling an Atmospheric Ammonia Condenser (83671). A. G. Solomon. Ills. 2500 w. Pr Pt Eng—Jan. 15, 1918. Troubles due to coils made of pipe galvanized on inside as well as outside.

See also Thermodynamics, under MEASUREMENT.

Carbonic Anhydride Refrigeration Plant (82526). Ills. 1500 w. Ht & Vt Mag—Nov., 1917. Requirements; comparison with ammonia plants, etc.

Circulation in Flooded System (82398). Ills. 1500 w. Pr Pt Eng—Nov. 15, 1917. A. H. Baer describes interesting experiments on the behavior of liquid ammonia.

Electricity Applied to Mechanical Refrigeration (82179). Harry D. McKinney. Ills. 2500 w. Elec J1—Nov., 1917. The absorption and compression systems explained; comparisons of prime movers for compressors.

Hints on Ammonia-Compressor Lubrication (82522). E. W. Miller. 1500 w. Power—Nov. 20, 1917. Too much oil; blowing out oil trap; quality of oil.

Purification of Distilled Water (82227 A). Harry B. Hommon. 2000 w. Ice & Refrig—Nov., 1917. Criticisms and suggestions to prevent water from being contaminated.

Multiple Effect Compression Ice-Making and Refrigerating Machines (88865 A). Ills. 1000 w. Engng—Aug. 23, 1918. A type of CO₂ refrigerating machines which differs from the ordinary compression machine.

Radiation

An Easy Way of Figuring Radiation (82691). K. Toensfeldt. 1000 w. Power—Nov. 27, 1917. Charts showing the heat losses and radiation required for 13, 18-, and 22-in. brick walls.

Radiators

Report of Committee on Standard Method of Testing Radiators (83958 D). 1500 w. Am Soc Ht & Vt Engrs, J1—Jan., 1918.

Schools

School Building Heating and Ventilation (88223). Samuel R. Lewis. Ills. 2500 w. Ht & Vt Mag—Aug., 1918. Describes systems and arrangements recently used.

Soft Coal

The Economical Purchase and Use of Soft Coal for Heating Homes (82113). Ills. 2500 w. Ht & Vt Mag—Oct., 1917. Information from a circular compiled by the Engineering Experiment Station of the University of Illinois.

Steam and Electric

Public Steam and Electrical Systems (84802). J. A. M'Hollan. 2000 w. Elec Wld—March 9, 1918. Analysis of the building heating situation in large cities.

Steam Heating

Dripping One-Pipe Steam-Heating Systems (88062). Albert L. Baum. Ills. 1200 w. Power—Aug. 6, 1918. Measures that will tend to obviate all forms of noises and render quick heating an easy matter.

One-Pipe Gravity Steam Heating Systems (82525). Harold L. Alt. Ills. 3500 w. Ht & Vt Mag—Nov., 1917. Essential points of design.

Steam Mains

Expansion Bends (82540 A). Ills. 1200 w. Mech Wld—Nov. 2, 1917. Approximate investigation to determine means of quickly finding the dimensions of a horse-shoe bend.

Surface Resistance

A Study of Surface Resistance with Glass as the Transmission Medium (82920 A). H. R. Hammond and C. W. Holmberg. Ills. 10 pp. A S M E—Dec., 1917. Investigations in the

Temperatures

thermal testing plant of the Penn. State College, giving a formula.

Temperatures

Temperatures and Their Duration During the Heating Season (87964 A). Reginald Pelham Bolton. 1000 w. A S M E, J1—Aug., 1918. A study of the effect of low temperatures upon installations of apparatus for heating buildings.

Temperature Regulating

Care of Pneumatic Temperature Regulation Systems (88581). 1800 w. Power—Sept. 3, 1918. General suggestions.

Thawing Plant

Coal Car Thawing Plant Built of Precast Concrete Units (84008). Scott W. Linn. Ills. 1200 w. Eng News-Rec—Jan. 31, 1918. Hot air is blown around trains of cars containing frozen coal housed in unit concrete building.

Thermics

Thermics (82407 A). Otto B. Goldman. 30 pp. Ore Soc Engrs, J1—Oct., 1917. Serial, 1st part. Present article deals with the properties of heat.

Tunnel Ventilation

Ventilation of Woodhead Tunnel, Great Central Railway (87922). James B. Ball. Ills. 1000 w. Eng & Con—July 31, 1918. English tunnels between Manchester and Sheffield on the Great Central Ry. Conditions and remedies.

Ventilating the Big Highway Tunnel (87623). Ills. 1800 w. Com Air—June, 1918. Considers this problem in connection with the proposed highway tunnel under the Hudson river from Jersey City to New York.

Ventilation of Subways and Tunnels (86614). From *La Genie Civil*. 1200 w. Eng & Con—May 29, 1918. Deals especially with metropolitan subways.

The Proposed New Jersey-New York Vehicular Tunnel (85717). Maps and Ills. 2500 w. Ht & Vt Mag—April, 1918. How the problem of ventilation will be solved in the new highway under the Hudson River.

Underground

Underground Pipe Mains—Material, Depreciation, Sizes for Steam and Water (87572). Charles L. Hubbard. 2500 w. Power—July 16, 1918. Advantages and disadvantages of steel and wrought iron, for steam or water.

Problems in Underground Pipe Constriction (87030). Ills. 600 w. Heat & Vent Mag—June, 1918. Study of contrasts between work in medium-sized

HEATING AND COOLING**Workshops**

cities and in downtown district of New York.

University Buildings

Measurements of Low Pressure Steam Used for Heating the Buildings of the University of Michigan (85052). J. E. Emswiler. 2500 w. Heat & Vent Mag—March, 1918. Data relative to the amount of steam required, with description of method of measurement.

Vapor Heating

Modern Practice in Vapor Heating (86422). Harold L. Alt. Ills. 2300 w. Ht & Vtg Mag—May, 1918. Serial, 1st part. Methods and devices.

Ventilation

A Survey of Cloth Window Ventilation (82524). John B. Todd, in *School and Science*. 1800 w. Ht & Vt Mag—Nov., 1917. Schools using cloth screens, and conclusions.

Ventilation of Army Barracks (82460 D). W. J. Mauer, with discussion. Ills. 21 pp. Am Soc Ht & Vt Engrs, J1—Oct., 1917. Defects in construction of the new barracks from a standpoint of ventilation and sanitation.

A Ventilation Paradox (89639). Thomas R. Wilson. Ills. 1200 w. Ht & Vtg Mag—Oct., 1918. Serial, 1st part. The use of air from Chicago's freight tunnel as a refrigerating agent and fuel conservator.

The Movement to Eliminate Mechanical Ventilation in New York City's Public Schools (89640). 1500 w. Ht & Vtg Mag—Oct., 1918. Action taken by the N. Y. City Dept. of Health based upon classroom tests in twelve school buildings.

Ventilation Test of the Lewis Champlin School (83110). Ills. 2500 w. Ht & Vt Mag—Dec., 1917. Serial, 1st part. Gives conditions found in Chicago school building equipped with latest type of heating and ventilating system.

Warehouse

Large Apple Storage Warehouse (84806 A). Ills. 1200 w. Ice & Refrig—March, 1918. Concrete fireproof building in Winchester, Va., with equipment.

Workshops

Heating and Ventilation of Workshops (87939 A). Ills. 1200 w. Engr—July 5, 1918. Arrangement of a low-pressure hot-water system with reinforced circulation.

Steam-Heating of Workshops (88028 A). 2000 w. Mech Wld—May 17, 1918. The principal factors involved.

HYDRAULIC MACHINERY

Turbines

Centrifugal Pumps

Characteristics and Specific Speeds of Centrifugal Pumps (83018 F). F. G. Hechler. Ills. 5000 w. Am Soc Nav Engrs, J1—Nov., 1917. Deals with their operation and probable performance under various conditions.

Canadian-Built Centrifugal Pumps of Modern Design (87207). Ills. 2800 w. Pwr House—June, 1918. Steam, electric and gasoline driven pumps.

Testing Chicago's New Centrifugal Pumps (82225). Ills. 2500 w. Power—Nov. 6, 1917. Tests of two 30,000,000-gal. steam-turbine, reduction-gear centrifugal pumps equipped with hydraulic-driven auxiliaries.

Laboratory

See same heading under Measurement.

Mill Pumping

Mill Pumping Systems (82759 A). A. W. Allen. 1800 w. Met & Chem Eng—Dec. 1, 1917. Adaptation of various systems to the pumping of water, slime pump and sand pump, for low medium, and high lifts.

Nozzles

Lo Scarico Sincrono (86463 B). M. Lo Presti. Ills. 3500 w. L'Industria—Mar. 31, 1918. Serial, 1st part. Nozzle mechanism for regulating flow to water turbine. Calculations for design.

Pumping Engines

Steam Pumping Engines (87579 D). Alfred O. Doane, with discussion. 11 pp. N E W-Wks Assn, J1—June, 1918. Types are considered.

See same heading under MINING AND METALLURGY, *Mine Operation*.

Triple-Expansion Pumping Engines for the London County Council (85760 A). Ills. and Plate. 1200 w. Engng—April 5, 1918. Serial. 1st part. Centrifugal pumping plant recently installed at one of the sewage-pumping stations.

Pumping Equipment

The Past and Present Pumping Equipment of the Manchester Pumping Station (87583 D). James H. Mendell. 1200 w. N E W-Wks Assn, J1—June, 1918. Reviews past and present equipment of the city of Manchester, N. H.

Pumping Station

The Ridout St. Station of the London Public Utilities Commission (87206). W. F. Sutherland. Ills. 3500 w. Pwr House—June, 1918. Details of the water supply of London, Ont., particularly the air-lift wells at the Ridout pumping station.

Pumps

One-Hundred-and-Ten-Million Gallon Pump for St. Louis (82774). H.

F. Gauss. Ills. 1200 w. Power—Dec. 4, 1917. A steam-turbine driven centrifugal pump having a maximum capacity of 110,000,000 gal. against a head of 65 feet.

Some Notes on Air-Lift Pumps (83-065 A). A. W. Purchas. Ills. 3500 w. Engng—Nov. 23, 1917. Serial, 1st part. Read before Inst of Mech Engrs. Account of several series of tests, with description of methods and equipment.

The Automatic Control of Electrically Driven Hydraulic Pumps (83080 A). 800 w. Engr—Nov. 30, 1917. From a lecture, by Alfred Towler, before Leeds Ass'n of Engrs.

Points in Pump Selection (89027). B. N. Everett. 1200 w. Power—Sept. 24, 1918. Calls attention to certain points.

The Application of Diaphragm Pumps to Metallurgical Work (83774 N). L. B. Eames. Ills. 1200 w. Chem, Met, & Min Soc of S Af, J1—Oct., 1917. Its limitations and usefulness.

Pumping

Some Canadian Pumping Plants (83-460). A. Huguenin. Ills. 3000 w. Can Engr—Jan. 3, 1918. Details of plants illustrating various installations.

Syphons

The Flow of Water in Syphons (83-115 N). Mark Halliday, with discussion. Ills. 1200 w. Instn Min Engrs, Trans—Nov., 1917. Analysis of the flow of water in syphons, simple and compound.

Turbines

Speed Considerations in Water Power Developments (82887 A). R. E. Neale. 3000 w. Eng Rev—Nov. 15, 1917. Details of a new turbine attracting attention in Norway, Sweden, and Germany—the Kaplan turbine.

Steps in Turbine-Runner Design That Engineers Should Know (82205). Walter C. Pomeroy. Ills. 2000 w. Eng News-Rec—Nov. 1, 1917. Design of hydraulic turbines and turbine runners.

Largest High-Head Francis Turbine (84065). Arnold Pfau. Ills. 2000 w. Power—Feb. 5, 1918. Hydro-electric equipment installed near Sumner, Wash. New 25,000 h. p. unit.

Extreme Schnellläufturbinen (84581 B). W. Zuppinger. Ills. 1500 w. Schweizerische Bauzeitung—Dec. 1, 1917. Design of high speed vertical water turbines.

Note Sur L'Évolution Des Turbines à Grand Vitesse (87722 C + D). M. Goupil. Ills. 2500 w. Characteristics of Francis turbines under different conditions.

MACHINE ELEMENTS AND DESIGN

Gears

Ball Races

Ball Races in Machine Tools (86037 A). Joseph Horner. Ills. 1500 w. Mech Wld—Apr. 19, 1918. Serial, 1st part. Improvements made necessary when employing them for heavy machine tools.

Bearings

White Brass Bearing Metals as a Substitute for High-Grade Babbitt (88749 A). L. D. Staplin. 1000 w. Am Mach—Sept. 12, 1918. Methods followed in using white brass as a bearing metal.

Ball Bearings for Machine Shop Equipment—I (87875 A). Edward K. Hammond. Ills. 7000 w. Machy—Aug., 1918. Serial, 1st part. Basic principles to be observed in the design of mountings for ball bearings and methods of lubricating.

Bronze Turntable and Movable Bridge Discs (88022). O. E. Selby. 4000 w. Fndry—Aug., 1918. Discusses specifications and changes recommended.

A Self-Adjusting Spring Thrust Bearing (86195 A). H. G. Reist. (Abstract.) Ills. 1200 w. A S M E, JI—May, 1918. A flexible bearing surface pressed against the runner by springs.

The Manufacture of Ball Bearings (86134 A). Ills. 3000 w. Engr—Apr. 12, 1918. Serial, 1st part. Works of the Skefko Ball Bearing Co., Ltd., at Luton, Bedfordshire, Eng.

Roller Bearings for Machine Shop Equipment (89189 A). Edward K. Hammond. Ills. 6000 w. Machy—Oct., 1918. Serial, 1st part. Fourth of a series of articles on bearings.

A Self-Adjusting Spring Thrust Bearing (87449 A). H. G. Reist. Ills. 2000 w. Gen Elec Rev—July, 1918. Discussion of bearing design and of the construction and operation of the self-adjusting spring thrust bearing.

Bearings for Machine Shop Equipment (87227 A). Edward K. Hammond. Ills. 11500 w. Machy—July, 1918. Serial, 1st part. Design of different forms of bearings used.

Manufacturing Wright Roller Bearings (87234 A). Ills. 2000 w. Machy—July, 1918. Considers machining parts, heat-treating, assembling and inspecting.

Ball Bearings for Electric Motors (85544). A. H. MacCaffray. 1700 w. Am Mach—April 11, 1918. Ideas in regard to their use.

Adjusting Marine Engine Bearings (83722). William M. McRobert. Ills. 1200 w. Power—Jan. 22, 1918. Suggestions for care of bearings.

Ball Bearings for Electric Motors (83099). George Andrus. 2500 w. Am Mach—Dec. 20, 1917. Discussed from the standpoint of the user.

Care and Refitting of Engine Bearings (82747). C. H. Willey. Ills. 3000 w. Natl Engr—Dec., 1917. Locating knocks, adjusting bearings, etc. Bearings (82397). 1000 w. Pr Pt Eng—Nov. 15, 1917. Serial, 1st part. Composition of alloys employed.

Casting Bearings in Sand and Metal Moulds (82444 F). R. R. Clarke. 5500 w. A I Mt, JI—Sept., 1917. Practice and experience.

Cams

Cam Profiles (88391 A). William Ker Wilson. Ills. 1000 w. Mech Wld—July 26, 1918. Serial, 1st part. Investigates the effect which a modification of cam profile can produce upon the inertia pressure to which valve gear is subject.

Practical Cam Design (86276). L. G. Johns. Ills. 1200 w. Am Mach—May 16, 1918. Recommendations as to the best form of cam surfaces and the best operating angles for those surfaces.

Analysis of Valve Cams (86035 A). W. E. Wright. Ills. 1800 w. Mech Wld—Apr. 12, 1918. Outlines methods of procedure.

Drafting

Relation Between Force, Energy and Work (89644 A). Dexter S. Kimball. 1200 w. Am Mach—Oct. 24, 1918. Discusses problems of design making use of a flywheel as a concrete example.

Simple Drafting Room Methods (89091 A). G. F. Hamilton. 1500 w. Ind Man—Oct., 1918. System of a machine-building plant for recording drawings, etc.

Gages

See same heading under Measurement. Example of Precision Gage Making (86662 A). Ills. 1000 w. Machy—June, 1918. Methods of making and testing a gage requiring unusual accuracy.

Indicator Gages Used in Gasoline-Engine Construction (86666 A). C. C. Marsh. Ills. 4000 w. Machy—June, 1918. Gages for inspecting cylinder depth, length, external diameter, cam lift, profile, and eccentricity.

Gear Blanks

Heat Treatment of Gear Blanks (85939). C. R. Poole. 2500 w. Auto Ind—Apr. 25, 1918. Outlining the advantages of thoroughly annealed blanks.

Gears

Standardization of Gearing (85940). B. F. Waterman. From a paper read before the Am. Gear Mfrs. Assn. 3000 w.

Gear Shapers

MACHINE ELEMENTS AND DESIGN

Springs

Auto Ind—Apr. 25, 1918. Preparing to standardize practice.

The Design and Progress of the Floating-Frame Reduction Gear (86408 B). John H. Macalpine, with discussion. Ills. 71 pp. Engrs' Soc W Penn, Pro—Feb., 1918. Considers only toothed gearing.

Thickness of Involute Gear Teeth on Addendum Circle (85977 A). Reginald Trautschold. 2500 w. Machy—May, 1918. Method of generating silent gears.

Industrial, Mill or Job Gearing—To What Extent Can It Be Standardized? (85545). Frank Burgess. 3000 w. Am Mach—April 11, 1918. Subject of gear standardization discussed.

Economical Production of Accurate Hardened Gears (82781 A). F. B. Jacobs. Ills. 2500 w. Machy—Dec., 1917. Methods and fixtures used by progressive automobile manufacturers.

The Inspection of Gearing (82712). B. F. Waterman. 2500 w. Am Mach—Nov. 29, 1917. Methods used by Brown & Sharpe Mfg. Co.

See Standardization under INDUSTRIAL MANAGEMENT, Regulation.

Heat Treatment and Hardening of Gears (82568). W. H. Phillips. Read before Am. Gear Mfrs.' Assn. 2500 w. Am Mach—Nov. 22, 1917. Outlines modern methods.

The Inspection of Gears (82130 A). Benjamin F. Waterman. 2500 w. Machy—Nov., 1917. Testing spur bevel, helical, and worm gears.

Gear Shapers

Generating Cones and Irregular-Shaped Work (89641 A). Douglas P. Hamilton. Ills. 1500 w. Am Mach—Oct. 24, 1918. Outlines the possibilities of the gear shaping machine.

Gear-Teeth

Proportions of Stub Gear-Teeth (87334 A). 1800 w. Mech Wld—May 31, 1918. Systems coming into use.

The Shape of Gear Teeth (86448 A). I. H. Wright. Ills. 15 pp. Keighley Assn. Engrs—1916-17. Qualities of gear teeth which can be relied upon, suggesting means of avoiding interference.

Inventions

Inventions Relative to War Material (83601 A). W. Strother Smith. 6500 w. E Cb, Phila, JI—Jan., 1918. Ways engineers can help in this field.

Machine Elements

Photo-Elasticity (83927). 1500 w. Times Engng Supp—Nov. 30, 1917. Optical method of studying elasticity and strain. Paper by E. G. Coker before Institution of Automobile Engineers.

Machinery Arrangements

Machinery and Pipe Arrangements (89-578 A). C. C. Pounder. Ills. 1500 w. Mech Wld—Aug. 23, 1918. Serial, 1st part. Diagrammatic arrangements are shown and discussed.

Mechanisms

Ingenious Mechanical Movements (85974 A). Franklin D. Jones. Ills. 6000 w. Machy—May, 1918. Serial, 1st part. Mechanisms for transmitting, modifying and controlling motion.

Narrow Guides

Applications of the Narrow Guide (86243 A). Fred Horner. Ills. 800 w. Mech Wld—Apr. 26, 1918. Serial, 1st part. Applications of the narrow guiding principle on various types of machine tools.

Pinions

Electric-Railway Motor Pinion Making (89417 A). Ills. 1000 w. Am Mach—Oct. 10, 1918. Details of methods used.

Screw Threads

Progress Report of Committee on Limits and Tolerances in Screw Thread Fits (87961 A). Ills. & Tables. 6000 w. A S M E, JI—Aug., 1918. Methods of investigation and recommendations.

Screw Thread Situation in Great Britain and America (88041 B). E. H. Ehrman. Charts. 10 pp. S A E, JI—Aug., 1918. Reviews the early history of screw threads with Sellers and Whitworth profits, discussing details, etc.

The Relation of Screw-Thread Angles to Other Functions (89037 A). H. J. Bingham Powell. 1200 w. Am Mach—Sept. 26, 1918. Arguments in favor of the adoption of an international screw thread.

Screw Thread Commission (85395 A). 1500 w. Iron Age—April 4, 1918. Important bill before the House to establish a national standard.

Sprockets

Sprocket Design—Theory and Practice (89193 A). Wiley M. Free. Ills. 3500 w. Machy—Oct., 1918. Factor controlling designing of sprockets for malleable chain drives, and action of chain under different conditions.

Springs

Helical Springs (88601 A). M. H. Sabine. Ills. 600 w. Mech Wld—Aug. 2, 1918. A graphical method of giving requisite information for drawing-office use.

Design of Coil Springs (82593). W. Ferrier Brown. Ills. 900 w. Auto Ind—Nov. 22, 1917. With special reference to valve springs for automotive engines.

A New Theory of Plate Springs (85723 B). David Landau and Percy H. Parr. Ills. 26 pp. Fkn Inst, JI—April, 1918.

Reduction Gears**MACHINE WORKS & FOUNDRIES****Boring**

Serial. 1st part. Account of research work and the new theory developed.

Steam Plants

Steam Plant Design (88415). 1800 w. Times Engng Sup—July, 1918. Abstract of paper before British Electrical Engineers on higher pressures and superheat.

Reduction Gear

Steam Turbine Reduction Gear (85519 A). Ills. 1000 w. Mech Wld—March 22, 1918. Serial. 1st part. Chief points and methods adopted in determining the principal stresses and correct proportions.

Tool Designing

Efficiency in Tool Designing (82125 A). F. B. Jacobs. 2500 w. Machy—Nov., 1917. Methods of making tool designs; satisfactory drawing paper; checking a drawing.

The Executive as a Tool Designer vs. the Professional Tool Designer (82316). Donald Baker. 1500 w. Am Mach—Nov. 8, 1917. Arguments in favor of the practical professional tool designer.

Valves

Hand-Regulated Valves (86040 A). Ills. 2000 w. Mech Wld—Apr. 19, 1918. Serial, 1st part. Essentials of a good hand-regulated valve, and care needed in designing. Uses and troubles.

MACHINE WORKS AND FOUNDRIES**Aluminum**

Handling Aluminum in the Foundry (84542). Charles Vickers. Ills. 3500 w. Brs Wld—Feb., 1918. Manipulation of the metal; how to avoid losses.

The Practice of Melting and Casting Aluminum (84750). Robert J. Anderson. 2500 w. Fndry—March, 1918. Serial, 1st part. Effects of overheating, and results of experiments with dioxidizers.

On the Annealing of Aluminium (86213 A). Robert J. Anderson. Ills. 700 w. Engng—Apr. 12, 1918. Read before the Inst. of Metals. Details of the work.

Ammunition

Ammunition Problems in War Time (82393 A). A. L. Humphrey, with short discussion. Ills. 23 pp. Ry Cb Pitts, Pro—Sept. 28, 1917. Explains the enormity of the undertaking, giving details of the work in manufacturing shells.

Annealing

The Annealing of Metals (82962 N). F. C. Thompson, with discussion. 3000 w. Faraday Soc, Trans—June, 1917. Practical aspects of the problem.

Annealing by Muffle and Pot Ovens Compared (85402). Joseph B. Deisher. Read before Am. Fndry. Assn. 5000 w. Fndry—April, 1918. Carbon losses by these two methods are discussed, giving test results.

Appliances

Templets, Jigs and Fixtures (85534 A). Joseph Horner. Ills. 3300 w. Engng—March 15, 1918. Serial. 1st part. Explains the usefulness of these aids to machining, and the difficulties.

A Combined Milling Fixture and Drilling Jig (85687 A). Ills. 700 w. Mech Wld—April 5, 1918. Description and use.

Artificial Limbs

The Manufacture of Artificial Limbs at Messrs. Yarrow's Works (89536 A). Ills. 2200 w. Engr—Sept. 20, 1918. The designs and methods used and development of the work.

Axles

Hollow Steel Axles and Safety First (86015 A). Julian Pollak. Ills. 1000 w. Iron Age—May 2, 1918. Relatively stronger axles insured by more accurate heat treatment.

Baling

Scrap Metal Baling Press (84657 A). Ills. 800 w. Engng—Feb. 1, 1918. Built by Canadian-American Machinery Co., Ltd.

Bearings

Manufacture of a Self-Lubricating Bearing Material (84635 A). Ills. 1500 w. Machy—March, 1918. Production of "Graphalloy" by an impregnating process.

Bending Machine

Essentials of Bulldozer Operations—The V-Blocks (87926 A). J. V. Hunter. Ills. 4000 w. Am Mach—Aug. 1, 1918. Various classes of work that may be done on a bulldozer, showing the construction of V-blocks of different styles.

Bolts

Bolt Manufacture in Railway Shops (88014 A). M. H. Williams. Ills. 6000 w. Ry Mech Engr—Aug., 1918. Methods and tools necessary for the rapid production of bolts in railway shops.

Boring

Reboring Gas-Engine Cylinders (83,202 A). Ills. 1200 w. Mech Wld—Dec. 7, 1917. Details of methods used in reboring a cylinder with no plant at hand except a foot-lathe or two.

MACHINE WORKS AND FOUNDRIES

Cannon

Boxing Machinery

Boxing Machinery to Prevent Damage (87095 A). Luther D. Burlingame. Ills. 4000 w. Ind Man—July, 1918. Practice of the Brown & Sharpe Mfg. Co. in packing machinery and tools for shipment.

Brakes

Centrifugal Brakes and Clutches (84251 A). C. C. Richards. Ills. 2000 w. Mech Wld—Jan. 25, 1918. Advantages, and designing.

Brass

Melting Brass in the Induction Furnace (84414 N). G. H. Clamer. Ills. 15 pp. A I Mt, JI—Dec., 1917. Deals particularly with the Ajax-Wyatt form of induction furnace. Points requiring consideration.

Present Status of Brass Melting (86636). H. M. St. John. 3000 w. Elec Wld—June 1, 1918. Serial, 1st part. Fundamental principles of electric melting. Merits of different types of furnaces.

Manufacture of Cartridge Brass in England (83781). 1000 w. Brs Wld—Jan., 1918. From paper by H. W. Brownsdon, read before Soc. of Chem. Ind., England. Conditions requiring closest attention to insure success.

Brassfoundry Notes (82542 A). J. Peers. 1500 w. Mech Wld—Nov. 2, 1917. Methods used to prevent waste.

Heat Treatment of Brass in Neutral and Reducing Atmospheres (82571). A. H. White and B. A. Sanderline. 2500 w. Brs Wld—Nov., 1917. Report of experiments and results.

Fuel Economy Possibilities in Brass Melting Furnaces (82144 A). L. C. Harvey. Ills. 4000 w. Engng—Oct. 12, 1917. Suggestions as possible means of improving efficiencies of pit-fire furnaces for coke, oil or gas. Survey of fuel costs.

Brass Furnaces

Brass Furnace Practice, Some Problems and Suggestions (85777). Charles Vickers. Ills. 2500 w. Brs Wld—April, 1918. Types—particularly the Goldberger furnaces.

Brass Melting

Gas for Brass Melting (85779). Charles C. Krausse. Ills. 2000 w. Brs Wld—April, 1918. Details in designing furnace; burners; gas consumption, etc.

Brass Shells

Brass-Shell Drawing and Re-drawing (82321). George F. Kuhne. Ills. 1500 w. Am Mach—Nov. 8, 1917. Causes of defective work and methods of avoiding them.

Brass Works

Modern Plant for Manufacturing Brass (84439 A). Ills. 2000 w. Iron Age—

Feb. 21, 1918. Straight line routing in Cleveland works.

British Foundries

British Foundrymen Discuss Weighty Problems (88565). Ills. 2500 w. Fndry—Sept., 1918. After-war conditions discussed by president Thomas H. Firth.

British Workshops

British Workshops and the War (82154 A). Christopher Addison. 4500 w. S A E, JI—Oct., 1917. Account of the wonderful industrial development as a result of the war.

British Workshops and the War (82317). Extracts from report of Christopher Addison. Ills. 2500 w. Am Mach—Nov. 8, 1917. Résumé of their accomplishments since the beginning of the war.

Broaches

Designing and Using Broaches (82319). W. G. Groocock. 2500 w. Am Mach—Nov. 8, 1917. Arguments in favor of notching broach teeth, with other useful information.

Broken Hubs

Repairing a Cracked Irregular Hub (83100). J. V. Hunter. Ills. 1200 w. Am Mach—Dec. 20, 1917. Successful method.

Bronze

Aluminum Bronze as an Engineering Material (89192 A). 2500 w. Machy—Oct., 1918. Difficulties in casting, use and characteristics, composition, etc.

Bronze Tablets

Molding and Casting Ornamental Bronze Tablets (86011). Charles Vickers. Ills. 1200 w. Fndry—May, 1918. Difficulties are pointed out and mixtures considered.

Browning Gun

The Browning Machine Rifle and Gun (85173). Ills. 1500 w. Am Mach—March 21, 1918. Details of machine guns which will be the standard equipment of the U. S. army in France.

Bullets

Notes on Shrapnel Bullets (82447 F). Harold J. Roast. 1800 w. A I Mt, JI—Sept., 1917. Methods of manufacture of the regular British shrapnel.

Calipers

Common and Special Micrometer Calipers (82128 A). F. Server. Ills. 2500 w. Machy—Nov., 1917. Illustrations of use in toolmaking and manufacturing.

Cannon

Cannon Making in Past Centuries (83663). H. H. Manchester. Ills. 1500 w. Am Mach—Jan. 17, 1918. Cannon manufacture between 1550 and 1800.

MACHINE WORKS AND FOUNDRIES

Cast Iron

Cable Winding

Automatic Cable Winding Mechanism (88501 A). Donald A. Baker. Ills. 1500 w. Machy—Sept., 1918. Arrangement for winding cable used in making lead balls for shrapnel shells.

Carburizing Plant

A Well-Arranged Carburizing Plant (82783 A). C. B. Langstroth. Ills. 1500 w. Machy—Dec., 1917. Plan and description of arrangement.

Casehardening

Testing the Relative Merits of Case Hardening Materials (89036 A). Charles N. Underwood. Ills. 1000 w. Am Mach—Sept. 26, 1918. Methods used in Remington Typewriter Works to determine qualities.

Castings

How One Steel Foundry Met the Need for Ship and Railway Castings (88568). H. Cole Estep. Ills. 3000 w. Fndry—Sept., 1918. Work at Birdsboro, Pa.

The Deformation of Steel Castings (88567). T. Brown. From paper before British Fndman's Association. 3500 w. Fndry—Sept., 1918. Deformities and their causes and prevention.

Castings a Slide Valve Locomotive Cylinder (86782). R. H. Palmer. Ills. 1200 w. Fndry—June, 1918. Details of operations involved in setting the cores.

How Crankcases for Sub-Chaser Engines Are Molded and Cast (86775). H. Cole Estep. Ills. 1500 w. Fndry—June, 1918. At a foundry in Muskegon, Mich.

Castings Floor Plate and Bed for a Boring Mill (82233). William J. Kihn. Ills. 1200 w. Fndry—Nov., 1917. How a large molding job was successfully handled.

How Automobile Motor Castings Are Molded (82230). Ills. 2500 w. Fndry—Nov., 1917. Molding methods employed by the Ferro Machine Foundry Co., Cleveland.

Some Comparative Tests on Test Bars and Actual Castings (82452 F). W. M. Corse and G. F. Comstock. Ills. 1200 w. A I Mt, JI—Sept., 1917. Results of tests and information of value.

The Swelling of Zinc Base Die Castings (82448 F). H. M. Williams. 900 w. A I Mt, JI—Sept., 1917. Results of investigations.

Castings Pipe Sections by Continuous Pouring (84088). Ills. 2500 w. Fndry—Feb., 1918. Unique pouring and conveying systems.

Making Hand Grenade Castings for Uncle Sam (85407). A. M. Jones. Ills. 1500 w. Fndry—April, 1918. Practice of a Milwaukee malleable iron plant that is producing 18000 grenades daily.

How Steel Castings Are Made in California (84753). Ills. 2500 w. Fndry—March, 1918. Account of the development of the industry on the Pacific Coast.

Patterns and Core Boxes for Gas Engine Beds (84749). Joseph Horner. Ills. 1500 w. Fndry—March, 1918. English practice described.

Castings Large Guns in the Early Eighties (83407). Job Goostray. Ills. 1500 w. Fndry—Jan., 1918. Difficulties encountered.

The Manufacture of Pattern Castings (83440 D). Henry M. Lane. Ills. 1500 w. Iron Age—Jan. 8, 1918. (Special No.) A new specialty foundry established by the Cope Pattern Works, of Detroit.

The Overweight Casting—Its Cause and Remedy (83409). R. R. Clarke. Ills. 7000 w. Fndry—Jan., 1918. Conservation of metal by proper molding.

Castings of Admiralty Bronze (85692 A). H. C. H. Carpenter and Miss C. F. Elam. Ills. 2500 w. Engng—March 29, 1918. Serial. 1st part. Read before the Inst. Metals. An investigation on sound castings; the cause and the remedy.

Copper Castings for Electrical Purposes (85712 A). G. F. Comstock. Ills. 1500 w. Iron Age—April 18, 1918. Use of silicon as a deoxidizer insures maximum electrical conductivity.

How Iron Castings for Big Gun Lathes Are Made (85401). H. Cole Estep. Ills. 2200 w. Fndry—April, 1918. Castings for some of the largest machine tools ever built.

Machining Operations on the Backbone of the Fordson Tractor (85600). J. Edward Schipper. Ills. 2500 w. Auto Ind—April 11, 1918. Operations on a 198-lb. casting.

Cooling Rate Affects Steel Casting Design (86007). J. G. Fletcher. 4500 w. Fndry—May, 1918. Serial, 1st part. Study of the contraction of steel.

Estimating the Weights of Castings Rapidly (86009). Warner Hathaway. Ills. 800 w. Fndry—May, 1918. Several easy methods of ascertaining the weights from blue prints.

Castings Prices

Steel Casting Prices Fixed by the Government (84085). 7 pp. Fndry—Feb., 1918. Schedule of agreed quotations on cast parts, including rolls and pinions.

Cast Iron

The Fluidity of Molten Cast Iron (88566). Matthew Riddell. From paper before British Fndman's Association. 3500 w. Fndry—Sept., 1918. Fluidity depends on the amount of superheat that has been imparted to it in the cupola.

Cast Steel

Scraping Cast-Iron Surfaces (84250 A). W. H. Rhodes. Ills. 1500 w. Mech Wld—Jan. 25, 1918. Notes on methods used by most of the large machine-tool firms.

Growth of Gray Cast Iron by Repeated Heating (86013). J. E. Hurst. Ills. 2500 w. Fndry—May, 1918. Investigation, with particular reference to cylinders and pistons for internal combustion engines.

Cast Steel

Electric Furnace and Steel Converter Compared (84087). C. R. Messinger. 2000 w. Fndry—Feb., 1918. Results obtained by both mediums for cast steel.

Chains

The Manufacture of Diamond Transmission Chain (89416 A). J. V. Hunter. Ills. 2000 w. Am Mach—Oct. 10, 1918. Describes some of the automatic and semi-automatic machines used.

Cast Steel Anchor Chain (87034 N). H. Jasper Cox, with discussions by W. L. Merrill and Chester K. Brooks. Ills. 45 pp. Am Soc Test Mat—June, 1918. Importance of reliability; essential qualities; experiments, specifications, etc.

Chisels

The Cold Chisel (89605). J. A. Lucas. Ills. 2500 w. Cl Age—Oct. 7, 1918. Difference of types and how to determine the kind to use on a certain job.

Coloring Metals

Approved Practice in Coloring and Lacquering (85778). James Steelman. Ills. 4500 w. Brs Wld—April, 1918. Serial. 1st part. Coloring effects, coatings, japaning, etc.

Core Boxes

Exceptional Gang Core Boxes (88468 A). J. V. Hunter. Ills. 2000 w. Am Mach—Aug. 29, 1918. Methods applicable where large numbers of small duplicate cores are being produced.

Core Drying

Gas Fired Ovens for Baking and Drying Cores (86776). Bruno Rahn. Ills. 1200 w. Fndry—June, 1918. Installations required for varying oven types.

Core Ovens

Electrically Heated Core Ovens (82451 F). C. F. Hirshfeld. 2500 w. A I Mt, Jl—Sept., 1917. Suggestions for electric core baking, giving results of experimental study.

Cores

Accuracy in Setting Cores (88634 A). J. V. Hunter. Ills. 1000 w. Am Mach—Sept. 5, 1918. A method of supporting large cores accurately from body of flask.

Producing Small Cores Cheaply in Quantities (85406). R. E. Kennedy. Ills. 5500 w. Fndry—April, 1918. Recommends the employment of women in core rooms.

MACHINE WORKS AND FOUNDRIES

Daylight

How Cores Are Used to Cut Molding Costs (83405). Ills. 1500 w. Fndry—Jan., 1918. Account of large savings in molding by a more extensive use of cores.

Brass Foundry Core-Making (84416 N). H. M. Lane. 6 pp. A I Mt, Jl—Dec., 1917. Suggestion for economy.

Crankshafts

Problems of Crankshaft Design (84641 A). Otto M. Burkhardt. Ills. 5000 w. A S M E, Jl—March, 1918. Mathematical deductions from examples are utilized to derive factors of safety and other specific values.

Crucible Furnaces

Building a High-temperature Fuel Furnace for Crucibles (83150 A). Walter J. May. Ills. 1200 w. Mech Wld—Dec. 14, 1917. Construction of such furnaces.

Some Improvements in Crucible Furnaces (83124). Charles Vickers. Ills. 1300 w. Brs Wld—Dec., 1917. Details of contrivances for the improvement of such furnaces.

Crucibles

Notes on the Crucible Situation (84411 N). A. V. Bleininger, with discussion. 18 pp. A I Mt, Jl—Dec., 1917. The manufacture and use.

How the War Affects Manufacture of Crucibles (82234). M. McNaughton. 1500 w. Fndry—Nov., 1917. Imports of plumbago and German clay cut off. Experiments with substitute materials. Read at Boston meeting of Am. Inst. of Metals.

Cupola Firing

Advantages Offered By the Oil-Fired Cupola (88024). W. S. Dickson. Ills. 900 w. Fndry—Aug., 1918. Crude oil is sprayed directly onto the coke bed.

Cupolas

Overcoming Troubles in Cupola Operation (85548 A). Paul R. Ramp. 3300 w. Iron Age—April 11, 1918. Suggestions on cupola practice.

Cutters

Cutters for Spur and Helical Gears (84-907 B). W. F. Mallory. Ills. 1600 w. Univ Col Jl Eng—Jan., 1918. Proper selection of cutters.

Cutting Tools

Milling Cutter Rake and Clearance (84-984 A). George W. Burley. 1400 w. Mech Wld—March 1, 1918. Explains effects of the angle of rake, etc.

Daylight

Daylight Facilities in Industrial Plants (82129 A). C. E. Clewell. Ills. 3000 w. Machy—Nov., 1917. Factors

Diamond Tools MACHINE WORKS AND FOUNDRIES Drilling Machines

governing the amount of light transmitted through windows.

Daylight in the Modern Shop (82174). C. E. Clewell. Ills. 2000 w. Am Mach—Nov. 1, 1917. Factors that affect the lighting, showing a number of glass arrangements.

Diamond Tools

Use of Diamond Tools in the Shop (83525). Frank A. Stanley. Ills. 2000 w. Am Mach—Jan. 10, 1918. Serial. 1st part. Classes of work for which they are adapted. Details of speeds, feeds and output.

Die-Casting

Die-Casting of Aluminum-Bronze (85525 A). H. Rix and H. Whitaker. Ills. 2500 w. Engrg—March 22, 1918. Advantages and methods.

Die-Casting of Aluminum Bronze Investigated (86781). H. Rix and H. Whitaker. Ills. 2500 w. Fndry—June, 1918. Aluminum alloys discussed and material for the dies described.

The Design of Die Castings (89030 A). M. Stern. Ills. 1500 w. Am Mach—Sept. 26, 1918. Some of the features of design.

The Manufacture and Use of Die-Castings (85189 B). Charles Pack, with discussion. Ills. 25 pp. Engrs' Soc W Penn, Pro—Jan., 1918. History and evolution, die construction, properties, etc.

Dies

Bulldozer Operations With One- and Two-Motion Dies (88747 A). J. V. Hunter. Ills. 4000 w. Am Mach—Sept. 12, 1918. Showing how a variety of work, including pipe bending, with one, two or more stage dies on a bulldozer.

Construction and Operation of Temporary Dies (88751 A). Hugo F. Pusep. Ills. 1200 w. Am Mach—Sept. 12, 1918. How they may be made and used when only a few parts of a given kind are wanted.

Correcting Dies That Failed to Draw (83347). A. C. Lindholm. Ills. 1200 w. Am Mach—Jan. 3, 1918. How incorrectly designed dies were altered.

Forging Machine Die Design (82124 A). E. R. Frost. Ills. 3000 w. Machy—Nov., 1917. Rules governing the length of upset in terms of bar diameter.

Locating Small Holes Accurately in Die Work (83350). Hugo F. Pusep. 800 w. Am Mach—Jan. 3, 1918. Method for locating holes where it is impossible to use buttons.

Differential Motions

Differential Motions and Planetary Gear Combination (84628 A). Franklin

D. Jones. Ills. 4000 w. Machy—March, 1918. Serial, 1st part. Mechanisms requiring differential motion and methods of determining relative velocities of planetary or differential gears.

Drafting

Organization and Wage Payment for the Drafting Department (89032 A). J. B. Conway. 2000 w. Am Mach—Sept. 26, 1918. System designed to effect maximum results.

Drafting-room

Business Methods in the Drafting-room (85346 A). Edward K. Hammond. Ills. 4000 w. Machy—April, 1918. Advantages of standardization in maintaining blueprint files, practice followed, etc.

Drawing

The Drawing-Office in Relation to Other Departments (83577 A). E. D. Roberts. Lecture to Jun. Instn. of Engr. 3500 w. Mech Wld—Dec. 21, 1918. Its relative position and importance.

Drawing-Room System in the Engineering Department (88750 A). G. F. Hamilton. Ills. 700 w. Am Mach—Sept. 12, 1918. Outlines methods used in the drafting room of the Goulds Manufacturing Co.

Drilling

Speeds and Feeds for Drilling (85348 A). Edward K. Hammond. Ills. and Tables. 4500 w. Machy—April, 1918. Methods of determining proper conditions of operation. Effect of high speed on efficiency.

A Corner Drilling Attachment (88389 A). Ills. 700 w. Mech Wld—July 26, 1918. An attachment for use in confined spaces.

Intensive Production—On Drilling Machines (86667 A). Edward K. Hammond. Ills. 4500 w. Machy—June, 1918. Organization of drilling department, and use of special equipment on machines to adapt them for a wide range.

Modern Drilling Practice (83416 A). Edward K. Hammond. Ills. 10000 w. Machy—Jan., 1918. Basic principles to be obtained in the operation of drilling machines to secure maximum efficiency.

Drilling Machines

Special Shell Drilling Machines (87880 A). Donald A. Baker. Ills. 800 w. Machy—Aug., 1918. Machines and jigs used in drilling fuse socket of shrapnel shells.

Unusual Operations on Drilling Machines (87874 A). Edward K. Hammond. Ills. 1500 w. Machy—Aug., 1918. Use for milling, broaching, driving studs, and assembling.

MACHINE WORKS AND FOUNDRIES

Flywheels

Drills

The Wilt Process Twist Drill Manufacture (87232 A). Franklin D. Jones. Ills. 5000 w. Machy—July, 1918. All machining operations, except grinding are done automatically.

The Care, Use, and Abuse of Drills (82814 A). J. Francis. 1000 w. Mech Wld—Nov. 16, 1917.

Driving Boxes

Machining Locomotive Driving Boxes (89448 A). Frank A. Stanley. Ills. 700 w. Ry Mech Engr—Oct., 1918. Outlines work at Sacramento, Cal., shops of the So. Pacific.

Drop Forging

Drop Forging Problems Discussed (87194 A). 5000 w. Iron Age—June 27, 1918. Topics discussed at the Am. Drop Forge Assn.

Drop Stamp

Heavy Friction Drop Stamp (86221 A). Ills. 800 w. Engr—Apr. 19, 1918. Details of a 9½ ton friction drop stamp and its operation.

Economic Departments

See same heading under INDUSTRIAL MANAGEMENT, *Management*.

Electrical Works

Express Works, Huddersfield (82292 A). Ills. 1000 w. Engr—Oct. 19, 1917. Details of new electrical engineering works.

Electric Furnace

Four Électrique Sans Électrodes (85,131 B). Ills. 1000 w. L'Industrie Électrique—Feb. 10, 1918. Electric furnace without electrodes. Lellis system.

Harnessing the Electric Furnace to the Foundry (83408). Douglas Walker. Read before the Am. Fndry. Assn. 3000 w. Fndry—Jan., 1918. Progress showing merit of this electrical unit.

Electric Melting

The Electrical Melting of Nonferrous Metals (84751). Dwight D. Miller. 5500 w. Fndry—March, 1918. Summary of results of experiments. Faults of present foundry practice.

Electric Motors

Manufacturing Small Electric Motors (82710). M. E. Hoag. Ills. 2000 w. Am Mach—Nov. 29, 1917. Interesting methods used.

Electrometallurgy

Electric Furnace Manufacture of Shoes and Dies on the Witwatersrand (83220 N). George H. Stanley. Also, Electric Steel-Melting Plant. W. Buchanan. Two papers discussed together. 15 pp. Chem, Met, & Min Soc of S Af, J1—Sept., 1917. Methods, type of furnace and plant, etc.

End Mill

An Inserted Tooth End Mill (82362 A). Ills. 700 w. Mech Wld—Oct. 26, 1917. A built-up end mill, a drilling jig, and a special appliance in the making of the same are shown.

Essington

Modern Plant Will Make Turbines (87829 A). Ills. 1800 w. Mar Rev—Aug., 1918. Equipment of new Essington works for maximum production of ship propelling machinery.

Faceplate Aids

Faceplate Accessories (87687 A). G. W. Smith. Ills. 600 w. Mech Wld—June 28, 1918. Aids for ordinary lathe faceplate work and for use on the boring mill.

Factories

A Feminist Munition Factory (83084 A). Ills. 1200 w. Autocar—Nov. 10, 1917. Particulars of a factory in Scotland organized solely for educated women as workers.

Factory Lighting

Lighting Curtailment in the Industries (85476). A. L. Powell. 2000 w. Elec Wld—April 6, 1918. Adequate lighting essential to safety and to maximum production.

See same heading under INDUSTRIAL MANAGEMENT, *Management*.

The Problem of Artificial Light (83287 A). C. E. Clewell. Ills. 3500 w. Ind Man—Jan., 1918. How to evaluate lighting costs as a proportion of wages.

Files

The Sheffield File-Making Industry (84470 A). 1500 w. Ir & Cl Trds Rev—Feb. 1, 1918. Reviews the present condition and needs of this industry.

Finishes

Black and Steel Gray Finishes on Brass and Iron (87028). Fred J. Liscomb. 4500 w. Brs Wld—June, 1918. Considers finishes and methods.

Fluxes

Note on the Question of Fluxes (84417 N). E. A. Frohman, with discussion. 1500 w. A I Mt—Dec., 1917. Deals particularly with fluxes for non-ferrous metals.

Flywheels

Elements of Fly-Wheel Design from the Standpoint of Graphics (85520 A). Ewart S. Andrews. 1200 w. Mech Wld—March 22, 1918. Serial. 1st part. A study.

Flywheel Design for Rolling Mills (83991 A). G. E. Stoltz. 2500 w. Iron Age—Jan. 31, 1918. From paper before Am. Assn. of Iron & Steel Elec. Engrs. Selection and use of load curves.

Forgings MACHINE WORKS AND FOUNDRIES Foundry Losses

Moulding Fly-Wheels (84014 A). Joseph Horner. Ills. 1000 w. Mech Wld—Jan. 11, 1918. Serial, 1st part. From *Foundry Trade Journal*. Details of the work.

Forgings

The Forging of an Off-Set Jaw (83964). J. V. Hunter. Ills. 2200 w. Am Mach—Jan. 31, 1918. Methods of casting and forging intricate parts.

Machine Forging in Automotive Plants (88337). Ills. 2000 w. Auto Ind—Aug. 22, 1918. Methods employed; absence of waste of materials and elimination of machining.

Machine Forging (85688 A). D. M. Caird. From paper read before the Manchester Assn. of Engrs. 1800 w. Mech Wld—April 5, 1918. Serial. 1st part. Compares British and American methods in manufacturing rivets, methods of forging, etc.

Heat Treatment of Large Forgings: Methods and Apparatus (88820). H. H. Ashdown. Read before Inst. Mech. Engrs. Ills. 3500 w. Mar Eng, Can—Aug., 1918. Methods in use and their effects on the quality of the steel treated.

Forging in Dies Under the Steam Hammer (87335 A). Joseph Horner. Ills. 1500 w. Mech Wld—May 31, 1918. Serial, 1st part. Variations in methods available.

Notes on Crane Forgings (84252 A). Joseph Horner. Ills. 2000 w. Mech Wld—Feb. 1, 1918. Serial, 1st part. Details of methods used in making.

Foundries

Cincinnati Foundry for Making Special Castings (82798). Ills. 1500 w. Fndry—Dec., 1917. Details of equipment of foundry designed for gray iron, malleable, and semi-steel castings.

Organizing a Malleable Iron Foundry on 90 Days (82795). Ills. 2500 w. Fndry—Dec., 1917. How difficulties were overcome at a foundry in Richmond, Ind.

American and Foreign Steel Foundries (80238 A). Ernest F. Lange, in *Ir & Cl Trds Rev.* (Abstract.) 2500 w. Iron Age—Oct. 3, 1918. A British comparison of French, Belgian and American steel castings. United States molding and annealing called inferior.

Milwaukee Foundries Serve All Industry (89277). D. M. Avey. Ills. 3000 w. Ir Trd Rev—Oct. 3, 1918. Response to war demands.

Saving Man Power in the Foundry (89468). E. S. Carman. Read before Am. Fndmen's Assn. Ills. 2500 w. Ir

Trd Rev—Oct. 10, 1918. Explains advantages of machine molding.

The Chemist and Metallurgist in the Foundry (89159). F. E. Gardiner. Ills. 5000 w. Can Fndman—Sept., 1918. Skilled supervision of all processes now recognized as necessary.

Advanced Ideas in Gray-Iron Foundry (84238 A). Charles Lundberg. Ills. 1500 w. Iron Age—Feb. 14, 1918. Methods in a Chicago plant.

William Kennedy & Sons, Limited (84745). Ills. 2500 w. Can Fndman—Feb., 1918. Foundry and marine equipment shop at Owen Sound, Ont., sixty years old. Development, etc.

Gray Iron Foundry Designed to Save Manpower (86779). Ills. 4500 w. Fndry—June, 1918. New plant at Muskegon, Mich.

The New Lakey Foundry at Muskegon (86731 A). Harry C. Spillman. Ills. 1500 w. Iron Age—June 6, 1918. Details of a plant designed to take advantage of conditions of site.

Lift Trucks Cut Transportation Costs (86439 A). Ills. 1500 w. Iron Age—May 23, 1918. Raw materials, ladles, and finished product handled by electric and hand types at the Modern Foundry Co.'s plant.

Saginaw Malleable Iron Co.'s Plant (86145 A). Ills. 2500 w. Iron Age—May 9, 1918. Foundry of modern type for large production.

Foundry Equipment

Solving Foundry Transportation and Conveying Problems (82800). Robert E. Newcomb. Abstract of paper before Am. Foundry. Assn. Ills. 3500 w. Fndry—Dec., 1917. Design and application of modern labor-saving equipment.

Foundry Efficiency

Reflections from the Fettling Shop of a Steel Foundry (82195 A). J. Watson. From a paper before the British Found. Assn. Ills. 3000 w. Mech Wld—Oct. 19, 1917. Methods of manufacture in the molding shop are discussed.

Foundry Industry

Foundry Industry Makes Big Gain in Two Years (89226 B). Maps. 3000 w. Fndry—Oct., 1918. Increase and development. (Special number.)

Foundry Lighting

How to Solve a Foundry Lighting Problem (82797). C. E. Clewell. Ills. 1500 w. Fndry—Dec., 1917. Fundamental principles of illumination.

Foundry Losses

How the Engineer Stops Foundry Losses (88444 A). S. B. Phelps. Ills.

Foundry Metals MACHINE WORKS AND FOUNDRIES

Furnaces

2000 w. Ind Man—Sept., 1918. Defective castings reduced in number by attention to design.

Foundry Metals

Dealing With Foundry Metals Melting at High Temperatures (82364 A). Walter J. May. 2500 w. Mech Wld—Oct. 26, 1917. Materials, furnaces and fittings, and treatment of metals in getting them ready for casting.

Foundry Methods

The Stripping Plate Machine: Inception and Development (86894). Ills. 1200 w. Can Fndman—June, 1918. Serial, 1st part. Details of machines and work.

Reasoning Applied to Foundry Work—Its Rewards (86780). R. R. Clarke. 4500 w. Fndry—June, 1918. The value of brain power in solving foundry problems.

Handling Government Work in a Steel Foundry (86006). H. Cole Estep. Ills. 3000 w. Fndry—May, 1918. Many inspections and tests are made and every casting is stamped with the heat number.

Foundry Nonessentials

Essential Foundry Output Not Yet Defined (87287). 1500 w. Fndry—July, 1918. Discusses essentials and non-essentials in casting manufacture.

Foundry Practice

Win-the-War Methods at the Essington Foundry (87288). E. C. Kreutzberg. Ills. 3000 w. Fndry—July, 1918. How gray iron castings for ship-propulsion machinery are made at South Philadelphia.

Making a Pattern For a Gas Engine Cylinder (88025). Frank B. Raebig. Ills. 2200 w. Fndry—Aug., 1918. Describes also the construction of the core boxes and two methods of molding.

The Foundry Set Gate (86830 A). R. R. Clarke. 2200 w. Mech Wld—May 24, 1918. Its usefulness and methods.

Reminiscences of Early Steel Foundry Practice (83413). David McLain. Ills. 2500 w. Fndry—Jan., 1918. Read before Am. Fndry. Assn. Evolution of steel casting manufacture.

What Proper Routing Did for an Old Foundry (83415). H. E. Goetz. Ills. 1400 w. Fndry—Jan., 1918. Improvements resulting in greater efficiency.

Some Sand Mixing Methods (83780). C. Vickers. Ills. 1000 w. Brs Wld—Jan., 1918. Methods described.

Sweeping a Worm-wheel in Greensand (83692 A). James Edgar. Ills. 1000 w. Mech Wld—Dec. 28, 1917. Method suitable when there is no time to make a pattern.

Foundry Practice: Mechanical Tests for Cast Iron (86508 A). F. J. Cook. Ills. 29 pp. Keighley Assn Engrs—1916-17. Considers tests usually called for by engineers' specifications, and those adopted as a guide in the foundry.

Foundry Processes

Foundry Processes—Converter Steel Castings (87696). Charles Vickers. Ills. 2000 w. Brs Wld—July, 1918. Details of operation of a baby steel converter. Also the Stock oil-fired converter which requires no cupola.

Foundry Report

The Foundry Report an Important Matter (89158). D. S. Mann. 400 w. Can Fndman—Sept., 1918. Cost of each heat is carefully kept, so that correct costs of castings may be determined.

Furnaces

A Rocking Electric Brass Furnace (86656 A). H. W. Gillett and A. E. Rhoads. Ills. 7000 w. Met & Chem Eng—June 1, 1918. A new type of arc furnace developed by metallurgists of the U. S. Bureau of Mines.

Automatic Shell Heat Treating Furnaces (88796 A). W. J. Harris, Jr. Ills. 1800 w. Iron Age—Sept. 5, 1918. Describes mechanical devices used in a new gas-fired installation at Pawtucket, R. I.

Melting Furnaces (84669 A). T. W. Aitken. Read before British Found. Assn. 2000 w. Mech Wld—Feb. 8, 1918. Types and the work for which they are suited.

Heat Treating and Annealing Furnace with Oil Fuel Equipment (84980). Ills. 1200 w. Can Fndman—March, 1918. Detailed description.

A Rocking Electric Brass Furnace (88304). H. W. Gillett and A. E. Rhoads. Ills. 3000 w. Br Wld—Aug., 1918. Serial, 1st part. Electric brass furnaces in commercial use, furnaces under experimental test, with details of type named.

Furnaces for Open Annealing (89200 A). Walter J. May. Ills. 3000 w. Mech Wld—Sept. 6, 1918. Considers types, their chief features and management.

High-temperature Resistance Furnaces with Ductile Molybdenum or Tungsten Resistors (84362 D). W. E. Ruder. Ills. 1200 w. A I M E, Bul—Feb., 1918. Describes horizontal and vertical tubular furnaces, and a vacuum tungsten furnace.

Wincott Furnaces (86214 A). Ills. and Plates. 1500 w. Engng—April 19, 1918. Details of gas-fired steel melting furnaces, forge furnaces, shell heating furnace, and furnaces for annealing large steel castings and shells.

See also page 222.

Consult Classification of the Index. See page 9.

Fuse MACHINE WORKS AND FOUNDRIES Grinding

Furnaces for Munitions (85878). 2300 w. Times Engng Supp—March 29, 1918. Characteristics of heating furnaces for shell billets; annealing furnaces, etc.

Fuse

Making the Mark III Detonating Fuse (88497 A). Edward K. Hammond. Ills. 4000 w. Machy—Sept., 1918. Serial, 1st part. An important phase in the manufacture of munitions.

Manufacturing Base Plugs for the 80 Mark VIII Time Fuse (85165). John Campbell. Ills. 1200 w. Am Mach—March 7, 1918. Tools and operations used.

Loading and Assembling Time Fuses (85342). G. C. White. Ills. 5800 w. Machy—April, 1918. Complete equipment of a fuse loading and assembling plant, explaining how a fuse operates.

Fuse Manufacture

Manufacturing Time Fuse Rings (84-632 A). Donald A. Baker. Ills. 2500 w. Machy—March, 1918. Characteristics of machines for routing powder groove.

Gage Grinding

Interesting Examples of Gage Grinding (85176). S. A. Hand. Ills. 700 w. Am Mach—March 21, 1918. Work in shops of the Blair Tool and Machine Works, Inc.

Gages

Gage Making in a Shell Plant (88492 A). Franklin D. Jones. Ills. 3500 w. Machy—Sept., 1918. Sixth of a series of articles describing methods in a plant making the U. S. 75 MM. shell. Features in making working and inspection gages.

Notes on General Gaging and the manufacture of Gages (85172). H. James. Ills. 1500 w. Am Mach—March 19, 1918. Some of the pitfalls found and the remedies.

Some Types of Gages for Munitions of War (85179). H. J. Bingham Powell. 1000 w. Am Mach—March 21, 1918. Hints on gage making.

Making Whitworth Thread Gages (83977 A). Walter D. Woodworth and Herman H. Bender. Ills. 11000 w. Machy—Feb., 1918. Reviews practice of a successful manufacturer.

Galvanizing

Modern Practice in Galvanizing Sheets (88308 A). Clement F. Poppleton. Ills. 3000 w. Iron Age—Aug. 22, 1918. Serial, 1st part. Methods of constructing and operating galvanizing pots; preparation of material, and costs realized.

Gas Furnaces

Gas Furnaces (83923). 1000 w. Times Engng Supp—Nov. 30, 1917. Abstract of paper by Arthur Forshaw, be-

fore Manchester Dist. Junior Gas Assn. Design and manipulation for various kinds of melting furnaces.

Gasoline Motors

Building Motors with General-Purpose Machines (84241). Ills. 1500 w. Am Mach—Feb. 14, 1918. Serial, 1st part. How these machines are utilized in the manufacture of gasoline engines.

Gear Planers

The Sunderland Gear Planers (83378 A). Ills. & plates. 7000 w. Engng—Dec. 14, 1917. Explains principles governing the action.

Gears

Heat-Treating Gears for Army Trucks in the Electric Furnace (88746 A). Dwight D. Miller. 3500 w. Am Mach—Sept. 12, 1918. Very satisfactory results.

A Note on Spiral Gears (88390 A). Ills. 1200 w. Mech Wld—July 26, 1918. Has special reference to engine gears, where the gear ratio is two to one in most gas engines, and equal ratio in case of steam engines.

Patternmaking and Molding Cast Tooth Gears (88023). Jabez Nail. Ills. 2200 w. Fndry—Aug., 1918. Past and present practices discussing a gear-molding machine.

Graphic Method of Generating an Involute Gear Tooth (84630 A). Douglas T. Hamilton. Ills. 1300 w. Machy—March, 1918. Easy method of laying out gear teeth.

Grenades

Grenades for Our Army in France (89194 A). Ills. 1200 w. Machy—Oct., 1918. Information authorized by the U. S. War Department relating to the hand and rifle grenades used by the Army.

Grinding

Grinding Relief of Milling Cutters (88494 A). Ills. 1200 w. Machy—Sept., 1918. Comparison of use of disk wheels and cup-wheels and analysis of results.

The Grinding Wheel in the Foundry (83990 A). W. T. Montague. 4000 w. Iron Age—Jan. 31, 1918. From paper before Am. Found Assn. Factors contributing to their economical use.

Cylindrical Grinding (86038 A). William D. Adamson. Read before Jun. Instn. of Engrs. 1500 w. Mech Wld—April 19, 1918. Serial, 1st part. Details of the work.

Drill Grinding (85981 A). Edward K. Hammond. Ills. 4000 w. Machy—May, 1918. Requirements and methods.

Grinding 6-In. Shell-Boring Cutters (87928 A). George M. Dick. Ills. 500 w. Am Mach—Aug. 1, 1918. Describes a grinding fixture.

Grinding Hobs MACHINE WORKS AND FOUNDRIES Heat Treatment

Plain Cylinder Grinding Work (82401 A). 2500 w. Ry Mech Engr—Nov., 1917. Grinding machines handle some classes of work better than the lathe.

Grinding Hobs

Grinding Hobs to Remove Distortion (84625 A). Edward K. Hammond. Ills. 3500 w. Machy—March, 1918. Methods used by the Illinois Tool Works, Chicago.

Grinding Wheels

The Economical Foundry Use of Grinding Wheels (88021). W. T. Montague. Ills. 5500 w. Fndry—Aug., 1918. What wheels to use and how they should be operated.

Gun Equipment

Building Carriages, Caissons and Limbers for 75-MM Guns (82315). M. E. Hoag. Ills. 1500 w. Am Mach—Nov. 8, 1917. Serial, 1st part. Methods used at the Rock Island arsenal in the manufacture of gun equipment.

Guns

The Erosion of Guns (85791 D). Ills. 1100 w. A I M E, Bul—April, 1918. Discussion of Henry M. Howe's paper.

The Relining of Guns at the Watervliet Arsenal (85906). E. A. Suverkrop. 4500 w. Am Mach—April 25, 1918. Said to be the first published description of this important war economy. Methods employed. Serial, 1st part.

The Development of Gun Manufacture (89419 A). W. H. W. Skerrett. Ills. 4500 w. Am Mach—Oct. 10, 1918. Reviews the construction and manufacture of guns from the earliest times to the present.

Development of Gun Manufacture (88045 B). W. H. W. Skerrett, with discussion. Ills. 11 pp. S A E, Jl—Aug., 1918. Reviews development and discusses some recent problems in ordnance work.

La Fabrication Des Canons (88430 B). Ch. Dantin. Ills. 5600 w. Génie Civil—July 20, 1918. Fabrication of large guns in French munition works.

The British 6-In. Howitzer (88075 A). I. William Chubb. Ills. 6000 w. Am Mach—Aug. 8, 1918. Serial, 1st part. Gun-making in British shops.

The 75-Mm. Field Gun, Model 1916, M. III. (88322 A). Ills. 5000 w. Am Mach—Aug. 22, 1918. Details of the latest of the four types built by the U. S. Government.

The Three-Inch Anti-Aircraft Gun Model 1918 (87924 A). Ills. 4500 w. Am Mach—Aug. 1, 1918. Detailed description of model being used by this country.

Musket Manufacture in Past Centuries (85161). H. H. Manchester. Ills. 1000 w. Am Mach—Feb. 28, 1918. Methods of the 16th, 17th and 18th centuries.

The Erosion of Guns (84351 D). Henry M. Howe. Ills. 55 pp. A I M E, Bul—Feb., 1918. Treats of the hardening of the bore; the cracking of the bore; and possible palliatives of erosion.

The Madsen Gun (87352 A). Ills. 4000 w. Engr—June 7, 1918. Illustrated description of this automatic gun.

The Stokes Gun and Shell, and Their Development (87763 A). Wilfrid Stokes. Ills. 4500 w. Engng—June 28, 1918. Third Gustave Canet lecture before Junior Instn. of Engrs. Construction and operation.

The Manufacture of the Lewis Machine Gun (82851). Frank A. Stanley. Ills. 1200 w. Am Mach—Dec. 6, 1917. Serial, 1st part. Workmanship involved in manufacturing on a strictly interchangeable basis.

Handling Devices

British Shell-Shop Handling Devices—III (86566 A). George Frederick Zimmer. Ills. 4500 w. Ind Man—June, 1918. Final instalment of a series. Transporters and conveyors used; best methods of handling, etc.

See same heading under Transporting and Conveying.

Handling Work

Handling Production in a Small Shop (84916 A). Robert Thurston Kent. 3500 w. Iron Age—March 14, 1918. Planning and progress of work.

Hardware

Manufacturing Hardware for Reinforced Ammunition Boxes (82711). F. E. Merriam. Ills. 1500 w. Am Mach—Nov. 29, 1917. Shows what can be accomplished in press work with little equipment.

Heat Control

The Importance of Heat Control in Certain Engineering Operations (86036 A). O. Bertoya, Jr. 1000 w. Mech Wild—April 12, 1918. Satisfactory methods of tempering, hardening, annealing, etc.

Heat Treatment

Effect of Mass on Heat Treatment (87388 N). E. F. Law. Ills. 15 pp. Ir & St Inst—May, 1918. Experiments and results.

Possibilities of Double Heat-Treatment of Steel (83987 A). Bradley Stoughton. 1200 w. Machy—Feb., 1918. Abstract of an address before the Steel Treating Research Society of Detroit. The object, and some accomplishments. See p. 257.

High Temperature MACHINE WORKS AND FOUNDRIES

Lathes

Heat Treatment and Temperature Measuring for Shells (83101). J. R. Van Wyck. Ills. 2500 w. Am Mach—Dec. 20, 1917. Successful method used in the manufacture of 2,000,000 three-inch Russian shrapnel shells.

New Steel Works Heat-Treating Plant (82861 A). Ills. 1000 w. Iron Age—Dec. 6, 1917. At Canton, Ohio. Continuous automatic furnace for long round bars.

See *Gears*, p. 232; *Forgings*, p. 239.

High Temperatures

Dealing with Metals and Alloys Melting at High Temperatures (83578 A). Walter J. May. 1500 w. Mech Wld—Dec. 21, 1918. Suggestions for melting large quantities.

Hobbing Machines

Operating Instructions for Hobbing Machines (82126 A). Robert E. Newcomb. Ills. 2000 w. Machy—Nov., 1917. Instructions for Gould & Eberhardt. 72x20-inch automatic spur and helical gear hobbing machine.

Helmets

Ancient Helmet Making (88937 A). H. H. Manchester. Ills. 2500 w. Am Mach—Sept. 19, 1918. Describes helmets used from 2920 B. C. to the present time.

Hobs

Hobs and Hobbing (86350). F. G. Hoffman and John Edgar. 3000 w. Auto Ind—May 16, 1918. Hobbing process especially suitable for quantity production.

Inspection

Inspection Methods of the Future (87231 A). C. C. Marsh. 1700 w. Machy—July, 1918. Automatic inspection devices and their use.

Inspection (83106 N). R. K. Bagnall-Wild. 36 pp. Instn Aut Engrs—Oct., 1917. Presidential address to Instn. Aut. Engrs. of Gt. Britain. Why necessary. Methods, etc.

Inspectors and Inspection (83102). W. B. Seigle. 1500 w. Am Mach—Dec. 20, 1917. Problems that confront inspectors in their work.

The Inspection of Screw Gages for Munitions of War (83097). H. J. Bingham Powell. Ills. 7000 w. Am Mach—Dec. 20, 1917. Describes instruments needed and desirable methods.

Interchangeability

Interchangeability, Tolerances and Finish (83791). J. P. Brophy. 2000 w. Am Mach—Jan. 24, 1918. Ideas as to requirements.

Ironwork

The Ironwork of Jean Tijou (83266). R. Randal Phillips. Ills.

2000 w. Arch For—Dec., 1917. Serial, 1st part. Details of his craftsmanship at Hampton Court, England.

Jigs

Drilling Jigs Used in the Manufacture of Hosiery Machines (89034 A). Robert Mawson. Ills. 900 w. Am Mach—Sept. 26, 1918. Jigs used in making the Banner knitting machines.

A Crank Case Trunnion Jig (85174). Ills. 1000 w. Am Mach—March 21, 1918. For use in drilling holes in crank case of a 12-cylinder internal combustion motor.

Jig for Drilling Circular Screwing Dies (84012 A). Ills. 1000 w. Mech Wld—Jan. 11, 1918. Detailed description.

Joints

Riveted Joints (82545 A). W. K. Wilson. Ills. 2000 w. Mech Wld—Nov. 9, 1917. Determining the strength.

Keyways

Cutting Keyways (82538 A). J. Francis. Ills. 1100 w. Mech Wld—Nov. 2, 1917. Tools and methods used.

Laboratories

Planning a Research Laboratory for an Industry (87508 A). C. E. K. Mees. 14 pp. Sci M—July, 1918. Lecture delivered in New York, April 12, 1918. Directions for the organization and establishing of such laboratories.

Laboratory

Equipping a Shop Laboratory (87873 A). Ills. 2500 w. Machy—Aug., 1918. Arrangement and brief explanation of methods used in the analysis of iron and steel.

Testing Laboratory at the Fiat Works (87891 A). Ills. 900 w. Engr—June 28, 1918. Arrangements for testing both raw and finished material, at Turin, Italy.

U. S. Metals Refining Co.'s New Laboratory at Chrome, N. J. (84818). B. B. Hood. Ills. 1600 w. Eng & Min J—March 9, 1918. Chemical laboratory with facilities for all branches of analytical work.

Lathes

Lathes for the Present Gun Program (88752 A). A. L. DeLeeuw. Ills. 2000 w. Am Mach—Sept. 12, 1918. Suggestions for securing a sufficient number of lathes and other machine tools.

Operating the Gridley Automatic Turret Lathe (86669 A). Douglas T. Hamilton. Ills. 3500 w. Machy—June, 1918. Serial, 1st part. Instructions for tooling and operating.

New Design of High-Power Double-Acting Lathe Adapted for Machining Axle Forgings (85423 A). Ills. 1000 w. Ry & Loco Eng—April, 1918. Recently placed

Laundry Machinery MACHINE WORK AND FOUNDRIES Mechanical Drawing

on the market by the Niles-Bremont-Pond Co.

Simplified Lathe Adapted to Shell Work (89561 A). Ills. 1200 w. Iron Age—Oct. 17, 1918. Details of the Gisholt 16 and 25 in. simplified lathes.

21-In. Centre Sliding, Surfacing, Screw-Cutting and Taper Turning Lathe for Gun Work (87547 A). Ills. 500 w. Engng—June 21, 1918. Detailed description of lathe built in Manchester, Eng.

Cincinnati Acme Universal Turret Lathe (83967). Ills. 1800 w. Am Mach—Jan. 31, 1918. Descriptive.

Details of 9-In. Center Heavy Duty Shell Lathe (83759 A). Ills. 500 w. Engng—Dec. 28, 1917. Describes a lathe built in Cincinnati, Ohio.

Laundry Machinery

Recent Steam Laundry Machinery (85757 A). Ills. 2500 w. Engr—March 29, 1918. Latest types, developed as a result of war demands.

Machine Building

The Rising Cost of Machine Building (87929 A). Ludwig W. Schmidt. 2500 w. Am Mach—Aug. 1, 1918. Labor an important factor; values of material; factory cost.

Machine Forging

Machine Forging (86384 A). D. M. Caird. Ills. Abstract of a paper before the Manchester Assn. of Engrs. 4000 w. Ir & Cl Trds Rev—March 29, 1918. Deals with rivet heading machines, upsetting and forging machines, taper forging rolls, and bulldozers.

Machine Foundations

Foundations for Planers (83053). Terrell Croft. Ills. 4000 w. Am Mach—Dec. 13, 1917. Requirements, modern planer foundations, and methods of installing.

Machine Tables

Fixing-Up Work on Machine Tables (89527 A). Joseph Horner. Ills. 1800 w. Mech Wld—Sept. 20, 1918. Serial, 1st part. Principles underlying the general practice.

Machine Tools

See Time Studies, under INDUSTRIAL MANAGEMENT, *Management*.

New French Regulations Regarding Machine Tools (89245 A). 1500 w. Am Mach—Oct. 3, 1918. Rules decreed.

Demand for Machine Tools After the War (88232 A). Ludwig W. Schmidt. 2500 w. Am Mach—Aug. 15, 1918. Discusses conditions which will effect business after the war.

After-War Prospects for American Machine Tools in France (83789). C.

E. Carpenter. 2200 w. Am Mach—Jan. 24, 1918. Believes the demand will not decrease.

Machine-Tool Exports After the War (85543). Ludwig W. Schmidt. 2500 w. Am Mach—April 11, 1918. Suggestions for securing and maintaining a market.

Manufacture of Machine Tools in Switzerland (85175). C. E. Carpenter. 2000 w. Am Mach—March 21, 1918. Machines are now being exported.

Machine Tool Requirements of the Ordnance Department (86670 A). Abstract of an address by H. W. Reed, at Atlantic City. 2000 w. Machy—June, 1918. Outline of the large machine tools needed by the government.

5-Inch Spindle Duplex Boring, Drilling, and Milling Machine (84285 A). Ills. 900 w. Engng—Jan. 25, 1918. Detailed description.

Machining

Machining Pistons, Flywheels, and Cylinders of Gasoline Engines (88635 A). M. E. Hoag. Ills. 1000 w. Am Mach—Sept. 5, 1918. How automatics are used in the production of machine parts.

Machining Adjusting Collars (85731). W. G. Groocock. 2000 w. Am Mach—April 18, 1918. Discussion of jig design and suggestions.

Machining Parts of a Calculating Machine (83667). Ills. 900 w. Am Mach—Jan. 17, 1918. Most parts described are made in punch presses from sheet metal. Test gages and press tools used.

Machining an Automobile Differential Cross (87881 A). Albert A. Dowd. Ills. 1700 w. Machy—Aug., 1918. Sequence of operations.

Malleable Iron

Malleable Cast Iron (84140 A). E. Adamson. From a paper before the Staffordshire Ir. & St. Inst. 2500 w. Colly Gdn—Jan. 18, 1918. Points to consider in the production of malleable iron castings.

Mandrels

Mandrel Work (89199 A). Joseph Horner. Ills. 2000 w. Mech Wld—Sept. 6, 1918. Designs of mandrels and their use.

Maximiller

The Kempsmith "Maximiller" (89241 A). Ills. 4000 w. Am Mach—Oct. 3, 1918. Interesting features of a recently built powerful machine.

Mechanical Drawing

Mechanical Drawing and Sketching for Operating Engineers (85391). Ferrell Croft. Ills. 3000 w. Natl Engr—April, 1918. Representation of different forms of screw threads.

MACHINE WORK AND FOUNDRIES

Munitions

Melting

Melting Metals (85685 A). Walter J. May. 2500 w. Mech Wld—March 29, 1918. Suggestions for proper melting practice.

Metal Beds

The Manufacture of Metal Beds (88631 A). Frank A. Stanley. Ills. 2500 w. Am Mach—Sept. 5, 1918. Methods used in pouring great numbers of cast-iron joints.

Metallography

The Role of Metallurgy in the Foundry (82235). Robert J. Anderson. Read before the Am. Fndry. Assn. Ills. 3500 w. Fndry—Nov., 1917. How the microscope can be used to test and control product.

Milling Machines

Continuous Milling Machine (85415 A). Ills. 1000 w. Engng—March 8, 1918. Machine built in Mass., U. S. A., designed for continuous operation of the cutters.

Support for Milling Machine Arbors (87228 A). Luther D. Burlingame. Ills. 2000 w. Machy—July, 1918. Review of early designs and development of types now used.

Plain Knee Type and Similar Milling Machines (83730 A). M. H. Williams. Ills. 7000 w. Ry Mech Engr—Jan., 1918. Their uses and possibilities in railway shops.

Milling Practice

Milling Practice in Railway Shops (88689 A). Frank A. Stanley. Ills. 2000 w. Ry Mech Engr—Sept., 1918. Examples of cutters used with success in Sacramento shops.

Molding

Computing the Momentum of Melted Iron Entering Mold (89157). A. M. Older. Ills. 500 w. Can Fndman—Sept., 1918. Suggestions for molders.

Different Methods of Molding Large Kettles (89155). B. Frell. Ills. 2500 w. Can Fndman—Sept., 1918. Detailed description of satisfactory work after failure.

How Brass Carburetors Are Molded and Cast (89228 B). Ills. 3000 w. Fndry—Oct., 1918. Molding machines of the jar-ram squeeze type are employed; workmen held responsible for quality.

Mounting Pattern on Plates an Aid to Molding (89225 B). R. R. Clarke. Ills. 5000 w. Fndry—Oct., 1918. Methods described and their advantages and disadvantages discussed. (Special number.)

Electric Heating of Molds (86193 A). Harold E. White. (Abstract.) Ills. 1500 w. A S M E, JI—May, 1918. De-

scribes a novel method of applying heat to the molds.

Molding a Superheater Locomotive Cylinder (86008). R. H. Palmer. Ills. 1500 w. Fndry—May, 1918. Intricate casting involving the setting of a large number of cores.

Moulding Retorts in Loam (86245 A). B. Shaw. Ills. 1200 w. Mech Wld—April 26, 1918. Serial, 1st part. Methods successfully used.

Emergency Jobs (82539 A). F. Andrews. Ills. 1800 w. Mech Wld—Nov. 2, 1917. Describes the molding of two square pipes and a half-circular wheel guard. Unusual methods.

Sweeping Molds in Loam (84828 A). Charles A. Otto. Ills. 1600 w. Mech Wld—Feb. 22, 1918. Directions.

Why the Inclined Mold is a Fallacy (88018). R. R. Clarke. 1800 w. Fndry—Aug., 1918. Explains results of mold-inclining, showing its fallacy.

Results of Use of Permanent Molds in England (85405). 1800 w. Fndry—April, 1918. French mortar bombs were made by this method but have been discontinued and are now made in sand.

Molding Machines

Foundry Moulding Machines (87147). 1500 w. Times Engng Supp—May, 1918. Serial, 1st part. Patterns and tables.

Molding Machines Facilitate the Production of Castings for Tractors (86014). Ills. 1200 w. Fndry—May, 1918. Methods in a Cleveland, O., plant.

Moving Methods

Factory Moving (87230 A). L. J. Hengesbach. Ills. 2500 w. Machy—July, 1918. Methods of efficiently solving problems arising when moving machinery into a new factory.

Munition Factories

An Extemporised Munition Factory (86136 A). Ills. 1500 w. Engr—April 12, 1918. Serial, 1st part. Detailed description of an English factory and its equipment.

Munitions

Munitions of War and the Smaller Engineering Shops (87513 N). F. G. Thompson, with remarks. 20 pp. Instn C E Ireland, Trans—Vol. XLIII, 1918. Account of how the work was successfully carried out.

Converting a Factory for Munitions Manufacture (87307 A). John S. Holbrook. 3000 w. A S M E, JI—June, 1918. The plant of the Gorham Mfg. Co., at Providence, R. I.

Expenditure on Munitions (86724 A). 5000 w. Ir & Cl Trds Rev—April 19,

Nomography

MACHINE WORK AND FOUNDRIES

Patternmaking

1918. Abstracts from report of the Comptroller and Auditor-General.

Routing and Handling Shells (86668 A). James Forrest. Ills. 3000 w. Machy—June, 1918. Production methods and short cuts for getting out large shells.

Les Obus Shrapnels (87130 B). H. Volta. Ills. 2300 w. La Nature—May 25, 1918. Shrapnel shells; their manufacture and characteristics.

Sidelights on Winchester Gun Production (86840 A). W. E. Freeland. Ills. 4000 w. Iron Age—June 13, 1918. Control of tools and gages; time study methods and satisfactory results.

Birmingham and the Production of Munitions (85758 A). 3500 w. Engr—March 29, 1918. Serial. 1st part. The conversion and erection of factories and information gained on a visit of inspection.

Savings on Rifle and Munitions Contracts (85711 A). 1800 w. Iron Age—April 18, 1918. The cost-plus plan as applied in the Ordnance Department to reduce government outlay on war work.

The Birmingham Munitions Area (85691 A). 6000 w. Engng—March 29, 1918. Serial. 1st part. The important work being done to supply the needs of the army.

How Semisteel Shells Are Being Made in France (84748). E. Ronceray. 4000 w. Fndry—March, 1918. Methods of using this metal.

Manufacture of the U. S. 75-Millimeter Shell (84626 A). Erik Oberg. Ills. 2500 w. Machy—March, 1918. Serial, 1st part. Approved methods employed by the Am. Shell Co.

Manufacture of the 75-MM. High-Explosive Shell (85168). S. A. Hand. Ills. 1500 w. Am Mach—March 14, 1918. Serial, 1st part. Methods used by the Worthington Pump and Machinery Corporation, at Hazleton, Penn.

Special Machines for Producing 9.2-Inch Shells (85265 A). Ills. 1000 w. Engr—March 1, 1918. Describes a series of specially designed tools for producing high explosive shells.

Operations in the Manufacture of High-Explosive Shells (86049). Ills. 1500 w. Am Mach—May 2, 1918. Information from successful firms.

Nomography

Nomography, with Special Reference to Its Use in Engine Design (85701 N). F. Leigh Martineau and A. Marshall Arter. Ills. 40 pp. Instn Auto Engrs—March, 1918. The practical side of the question.

Nut Forging

Hollings Indenting Type of Nut-Forging Machines (88498 A). Ills. 1500 w.

Machy—Sept., 1918. Machine for making well-formed blanks, with a relative small amount of scrap.

Nut Making

A New Nut Making Machine (87402 A). Ills. 1000 w. Engr—June 14, 1918. Details of a machine designed and patented by Ernest Hollings.

Oil Furnace

How an Oil-Fired Malleable Furnace Operates (82236). Ills. 1200 w. Fndry—Nov., 1917. Advantage lies in uniformity of operation and labor saving.

Operation Diagrams

Operation Diagrams for the Executive (84564 A). Adalbert R. De Kuzelewski. Ills. 1800 w. Ind Man—March, 1918. How processes of manufacture and machine work may be visualized.

Ordnance

How Ordnance Production Has Gone Forward (86732 A). 3000 w. Iron Age—June 6, 1918. Last year's contracts. Changes in organization.

Patterns

The Pattern for a Wyper Shaft Bracket (88863 A). James Edgar. Ills. 1200 w. Mech Wld—Aug. 16, 1918. Directions for rather difficult work.

Accurate Setting of Patterns for Platemolding Machines (88843 A). Ills. 700 w. Mech Wld—July 12, 1918. Gives a method of accurately laying off the patterns and fastening them to the plates.

The Making of Better Patterns (89,243 A). Ellsworth Sheldon. Ills. 2000 w. Am Mach—Oct. 3, 1918. Details of some of the patterns and methods of a successful shop.

Checking Patterns (88027 A). Joseph Horner. 1500 w. Mech Wld—May 17, 1918. Directions.

Pattern Making: Economical and Efficient Methods (86895). M. H. Potter. 1600 w. Can Fndman—June, 1918.

Systematic Storage of Patterns (85817 B). Ills. 1200 w. Cas Eng Mthly—April, 1918. Details of an up-to-date system.

Practical Economies in Pattern Building (85162). W. Rockwood Conover. 2000 w. Am Mach—Feb. 28, 1918. Opportunities for more efficient methods.

Pattern for a Large Main Circulating Inlet Valve (83696 A). James Edgar. Ills. 1000 w. Mech Wld—Jan. 4, 1918. Directions for construction.

Patternmaking

Patternmaking Allowances (86039 A). James Edgar. 1300 w. Mech Wld—April 19, 1918. Importance of studying machining, the contraction of metals, and the annealing of steel in the pattern shop.

MACHINE WORK AND FOUNDRIES

Repair Shop

Picture Machines

Making a Moving Picture Machine (89421 A). M. E. Hoag. Ills. 1500 w. Am Mach—Oct. 10, 1918. Serial, 1st part. Manufacturing methods used by the Victor Animatograph Co.

Pipe Bending

Bending Racks and Roll Benders for Large Conduit and Pipe (87181). Terrell Croft. Ills. 1000 w. Elec Rev, Chi—June 22, 1918. Serial, 1st part. Types of bending outfits.

Pipe Foundry

Making Good with Tradition Discarded (84752). Ills. 4000 w. Fndry—March, 1918. Development of an industrial community around a pipe foundry near Birmingham, Ala.

Piston Rings

Casting Rings in Centrifugal Machine (89237 A). E. F. Cone. Ills. 3500 w. Iron Age—Oct. 3, 1918. Details of De Lavaud process, which gives large production and exceptional quality.

Plane Motion

General Theory of Plane Motion Rotation and Translation (83012 A). Francis W. Roys. 1500 w. Worc Poly Inst—Nov., 1917. Develops equations which may be used in solving engineering problems.

Planers

Metal-Planing Machines of Concrete (89075). 1000 w. Times Engng Supp—Aug., 1918. Large planing machine built of concrete for constructing gun-boring machines.

Planing Machines

Metal Planing Machines of Concrete (85394 A). Charles Lundberg. Ills. 2000 w. Iron Age—April 4, 1918. Manner of constructing the huge planing machines to machine beds of gun boring machines.

Making Concrete Metal-Planing Machines (85542). Ethan Viall. Ills. 900 w. Am Mach—April 11, 1918. Machines made from reinforced concrete.

Plating

A Model Modern Job Plating Shop (86447). Ills. 2500 w. Brs Wld—May, 1918. Account of one of the leading polishing and plating shops in New York City.

Production of Verde Antique Finishes (86446). Emil Haas. 1200 w. Brs Wld—May, 1918. Directions for working practice.

Pneumatic Tools

Pneumatic Hand-Tools (88029 A). C. Temple Orme. Abstract of paper before Jun. Instn. Engrs. 1500 w. Mech Wld—May 17, 1918. Deals particularly with pneumatic hammers.

Polishing

The Polishing Room (84544). J. F. Springer. Ills. 2500 w. Brs Wld—Feb., 1918. Pickling; treatment of the iron by the molder, etc.

The Polishing Room (82570). J. F. Springer. Ills. 4000 w. Brs Wld—Nov., 1917. Serial, 1st part. The polishing room of an electroplating plant. Use of the speed lathe, etc.

Portable Machines

Taking Machines to the Work (87871 A). Edward K. Hammond. Ills. 5000 w. Machy—Aug., 1918. Methods used in applying portable machines in ship operations and the advantages secured.

Precision Work

The Micrometer Head in Toolwork (83526). Hugo F. Pusep. Ills. 3000 w. Am Mach—Jan. 10, 1918. Methods.

Preheating

New Departure in Preheating (87843 A). J. B. Diehl. 2000 w. Weld Engr—July, 1918. Value and efficiency of the Wilderwax preheater.

Press

The Cut and Carry Type of Press (83051). G. R. Smith. Ills. 2000 w. Am Mach—Dec. 13, 1917. Details of machine and description of some of the work.

Production

Relation of Quantity Production to Cost (83209 A). A. G. Popcke. 3500 w. Ind Man—Jan., 1918. Labor analysis of manufacturing a shaft in lots of 1 to 200 pieces.

Projectiles

Making Semi-Steel Projectiles (89413 A). Ills. 4500 w. Iron Age—Oct. 10, 1918. Method of molding, including core making and of machining.

Puddling

A Summary of Attempted Improvements in the Puddling Process (86812 N). Cecil H. Desch. Ills. 32 pp. West Scot I & S Inst, JI—Jan.-Feb., 1918. Improvements aimed at; experiments, furnaces, etc.

Punching

Gag Punch for Structural Punch Press (84240). J. V. Hunter. Ills. 2000 w. Am Mach—Feb. 14, 1918. An efficient device for increasing the output of punch presses used on structural steel work.

Repair Shops

A Southwestern Repair Shop (85539). Frank A. Stanley. Ills. 2000 w. Am Mach—April 4, 1918. Methods used in overhauling mining and railroad equipment.

MACHINE WORK AND FOUNDRIES

Shells

Repetition Work

The Science of Quick Repetition (84129 N). W. Wilson. Ills. 1200 w. Cornwh Engr—Jan., 1918. Serial, 1st part. Experiences in British engineering shops. Speeding up munition making.

Rifle-Barrels

Special Automatic Rifle-Barrel Machine (82569). E. H. Ingram. Ills. 600 w. Am Mach—Nov. 22, 1917. Details of a machine that has increased production several hundred per cent.

Rifle Grenades

Making Malleable Cast Iron Rifle Grenades (84084). Ills. 3000 w. Fndry—Feb., 1918. How a daily average production of 25,000 of these castings was attained.

Riveting

Pneumatic Riveting Practice (85349 A). A. Mason MacFarland. Ills. 7500 w. Machy—April, 1918. Different types of tools and machines, their use, abuse, maintenance and repair.

Rustproofing

Rustproofing Iron and Steel (82780 A). Joseph W. Wunsch. Ills. 2200 w. Machy—Dec., 1917. Advantages and limitations of phosphatic treatment.

Salvaging

Salvaging Tools in War Time (84973 A). Edward K. Hammond. Ills. 6500 w. Machy—May, 1918. Methods of procedure in salvaging commonly used types of metal-cutting tools, and saving possible.

Sand-Blast

What the Sand Blast Means to the Foundryman (88020). H. L. Wadsworth. 2200 w. Fndry—Aug., 1918. Types of machines are discussed and their utility and value.

Development of the Pneumatic Sand-Blast (85180). Glenn B. Harris. Ills. 3500 w. Am Mach—March 21, 1918. Some of the recent improvements.

Scrapers

Hand Scrapers (84634 A). C. C. Marsh. Ills. 1100 w. Machy—March, 1918. Types and information concerning their making and use.

Screw Machine

Operating the Gridley Multiple-Spindle Screw Machine (85982 A). Douglas T. Hamilton. Ills. 3500 w. Machy—May, 1918. Instructions for tooling, setting up, and operating.

Screw Threads

Thread Rolling (85345 A). Franklin D. Jones. Ills. 6000 w. Machy—April, 1918. Serial. 1st part. Methods, various types of thread rolling machines and advantages and general application.

Grinding and Lapping Threads (87235 A). J. E. Lindgren. Ills. 1200 w. Machy—July, 1918. Attachments, fixtures and laps used for producing accurate threads.

General Thread Cutting Practice in the Lathe (84636 A). Franklin D. Jones. Ills. 6000 w. Machy—March, 1918. Important points on cutting single, multiple, and tapering threads by means of single-point tools and chasers.

Precision Screw Measuring Machine (83978 A). Ills. 1800 w. Machy—Feb., 1918. Apparatus for measuring pitch, pitch diameter, external diameter and angle of screw thread.

Thread-Cutting Attachments (83985 A). Franklin D. Jones. Ills. 7000 w. Machy—Feb., 1918. Standard and special mechanisms and attachments, and their use.

Screwing Tackle

Screwing Tackle and Gauge Departments at Openshaw Works (86402 A). Ills. 2000 w. Ir & Cl Trds Rev—March 8, 1918. Work of the gauge department and details of Whitworth measuring machine, etc.

Shafting

Making Cold-Drawn Shafting (82122 A). Edward K. Hammond. Ills. 6500 w. Machy—Nov., 1917. Features of practice in its manufacture. It is essentially wire-drawing on a large scale.

Shafts

Critical Speed in Tapered Shaft Design (88503 A). Alfred Musso. 1000 w. Machy—Sept., 1918. Derivation of formulae and examples illustrating their use.

Shell Factory

The Cunard National Shell Factory (87895 A). Ills. & Plates. 3500 w. Engng—July 5, 1918. Serial, 1st part. Detailed description of a factory converted to war service.

Shells

Making the U. S. 8-in. Shell (88745 A). M. E. Hoag. Ills. 2000 w. Am Mach—Sept. 12, 1918. Serial, 1st part. Shows practice in shops of the Root & Vandervoort Eng. Co. of Moline, Ill.

Machining and Gaging 9.2-inch High-Explosive Howitzer Shells (89190 A). M. H. Potter. Ills. 3500 w. Machy—Oct., 1918. Machines and tools used, successive order of machining operations and complete gaging equipment.

Shell Base-Cover Assembling Die and Press (89187 A). P. H. White. Ills. 700 w. Machy—Oct., 1918. Detailed description.

How Dummy Iron Shells Are Molded and Cast (88017). H. Cole Estep. Ills. 2000 w. Fndry—Aug., 1918. A two-

Shell Tools

MACHINE WORKS AND FOUNDRIES

Shop Practice

part flask is employed and most of the mold is in the cope.

Special Machine-Tool Fixtures for Making the British 18-Lb. Shell (88472 A). Chester B. Hamilton, Jr. Ills. 1000 w. Am Mach—Aug. 29, 1918. Adopting old machine tools for shell manufacture.

Substitutes for Steel for High Explosive Shells (88192 N). W. G. Dauncey. 1000 w. Can Min Inst, Bul—Aug., 1918. Considers the question of substituting other metals.

The Making of Pressed Sheet Metal Shells (84983 A). G. W. Smith. Ills. 1000 w. Mech Wld—March 1, 1918. Explains some of the fundamental principles.

Shell Tools

Boring and Reaming Tools for 220- and 270 m. m. French shells (83528). James Forrest. Ills. 1200 w. Am Mach—Jan. 10, 1918. Details of tools that have worked well.

Shop Practice

Modern Workshop Practice (88834 N). W. Wilson. Ills. 5000 w. Comwh Engr—Aug., 1918. Serial, 1st part. The science of quick repetition. A New Zealander's experience in British shops.

Managing Non-Repetitive Work (87161 A). Norman Howard. 3500 w. Ind Man—July, 1918. How to standardize conditions and operations for tool-making and machine-shop repairs.

A Western Railroad Repair Shop (88078 A). Frank A. Stanley. Ills. 1500 w. Am Mach—Aug. 8, 1918. Methods of aligning cross-head guides, renewing driving boxes, etc., in Reno, Nev., shops.

Manufacturing the Johnson Friction Clutch (88080 A). Ills. 1500 w. Am Mach—Aug. 8, 1918. Methods and processes described.

Sheet-Metal Work (88077 A). E. Andrews. 2500 w. Am Mach—Aug. 8, 1918. Suggestions in regard to the increasing use of sheet metal.

Using a Punch Press in Lieu of Bending Rolls (88076 A). J. V. Hunter. Ills. 1500 w. Am Mach—Aug. 8, 1918. Shows how difficult jobs in bending and forming sheet metal may be handled on a punch press by means of wooden dies.

Laying Out Angular Work (87341 A). Claude W. Hill. Ills. 1600 w. Engng—May 31, 1918. Shows the relative accuracy that may be obtained with different instruments.

Efficient Pattern Shop Methods That Save Time (85404). J. H. Gard. Ills. 1000 w. Fndry—April, 1918. Novel method of producing a hopper pattern, and cheaply made gear and pulley models.

General Work in the Small Shop (85518 A). Ills. 1800 w. Mech Wld—March 22, 1918. Serial. 1st part. Articles intended to benefit men in small shops with limited facilities.

Bending and Drilling Tubes, Angles and Flat Sections (85908). Frank A. Stanley. Ills. 3000 w. Am Mach—April 25, 1918. Interesting features of a factory engaged in work made from tubing.

Sensitive Drilling Machine Spindle Construction (85347 A). Charles E. Bernitt. Ills. 4000 w. Machy—April, 1918. Development and features of design.

Two Short Operations Better Than One Long One (85841 A). Aldabert R. De Kuzelewski. 1000 w. Ind Man—May, 1918. Suggestion for expediting work based on shop experience.

Emergency Methods of Cutting and Drilling Glass Disks (85170). J. A. Lucas. Ills. 1200 w. Am Mach—March 14, 1918. Tools and methods that may be used in the average small shop.

Manufacturing the Addressograph (85178). M. E. Hoag. Ills. 1000 w. Am Mach—March 21, 1918. Processes described.

American Practice in Work Handling (86242 B). Douglas T. Hamilton. Ills. 3500 w. Auto Engr—April, 1918. Examples of methods in various well-known plants.

Machining the Stitch-Making Mechanism for Hosiery Machines (86149). Robert Mawson. Ills. 1500 w. Am Mach—May 9, 1918. Operations on interchangeable parts.

A Railroad Wheel Shop in Nevada (82318). Frank A. Stanley. Ills. 1500 w. Am Mach—Nov. 8, 1917. Operations on wheels and axles in a shop of the Southern Pacific.

The Use of Lines in Finding the Blank (82544 A). G. W. Smith. Ills. 1500 w. Mech Wld—Nov. 9, 1917. Suggestions for toolmakers employed on press tools.

Correct Way of Making an Engine Piston Pattern (83412). Frank B. Raebig. Ills. 1500 w. Fndry—Jan., 1918. How to obtain economical results.

Manufacturing a Steel Chair (83664). G. F. Wetzel. Ills. 1500 w. Am Mach—Jan. 17, 1918. Methods of making an all-steel chair. Work on tubing and sheet metal.

Marking Off (83694 A). Joseph Horner. Ills. 1500 w. Mech Wld—Jan. 4, 1918. Serial. 1st part. Essential articles of the equipment, and methods used.

Operations in a Creamery Machinery Plant (83962). Frank A. Stanley. Ills.

Shop Problems**MACHINE WORK AND FOUNDRIES****Taps**

2200 w. Am Mach—Jan. 31, 1918. Methods of coiling copper pipe on large modern drums, and of machining brass valves and plugs.

The Making of Plug and Ring Gages (83965). J. H. Smith. 2500 w. Am Mach—Jan. 31, 1918. Suggestions.

New Devices in Soo Wheel Shop (89-449 A). Ills. 500 w. Ry Mech Engr—Oct., 1918. Shifting platform at press and automatic discharging axle carrier add to efficiency.

Manufacturing a Calculating Machine in a Western Shop (82854). Frank A. Stanley. Ills. 1500 w. Am Mach—Dec. 6, 1917. Details of numerous tools and processes.

Methods of the Nash Motors Co. (83213). Ills. 1200 w. Am Mach—Dec. 27, 1917. Serial, 1st part. Applications of single-purpose machines.

Progressive Battery Manufacture (82951). Ills. 2500 w. Auto Ind—Dec. 6, 1917. Conveyor system used extensively.

Shop Problems

Drilling Jig for Dust Cover (84827 A). W. Richards. Ills. 500 w. Mech Wld—Feb. 22, 1918. Two solutions of the problem are given.

A Press-Made Clip (85428 A). G. W. Smith. Ills. 1000 w. Mech Wld—March 15, 1918. Describes necessary tools and methods.

Shops

A Modern Light Machine Shop (84675 A). Herbert Carpenter. Ills. 2800 w. Engr—Feb. 1, 1918. Details of a particular form of construction and its advantages, with various aspects of the general question.

A Big Jobbing Shop and Foundry in Texas (83214). Frank A. Stanley. Ills. 2500 w. Am Mach—Dec. 27, 1917. Methods used in handling large work in machines generally considered inadequate.

Increases Strip Steel Capacity (89650). Ills. 2000 w. Ir Trd Rev—Oct. 24, 1918. Detailed description of plant of the Weirton Steel Co., Weirton, W. Va.

Sine Bar

Uses of the Sine Bar (82171). E. J. Bryant. Ills. 1200 w. Am Mach—Nov. 1, 1917. Describes its use in one of the large tool, gauge, and fixture shops.

Sketching

Mechanical Drawing and Sketching for Operating Engineers (82254). Terrell Croft. Ills. 3500 w. Nat'l Engr—Nov., 1917. Serial, 1st part. Directions

for making sketches of emergency repair parts.

Skimming Gates

Various Types of Skimming Gates Used for Different Work (89156). Ills. 700 w. Can Fndman—Sept., 1918. Describes types, favoring the whirl gate.

Smiths

The Engineer's Smithy (88387 A). Joseph Horner. 1500 w. Mech Wld—June 21, 1918. Serial, 1st part. A review of advance made in this practice.

Spain

Machine Tools in Spain (82855). Henry S. Moos. 2000 w. Am Mach—Dec. 6, 1917. Present and future trade prospects.

Springs

Laminated Steel-Spring Proportions (83963). H. H. Kennedy. 900 w. Am Mach—Jan. 31, 1918. Shows how various effects are secured.

Device for Winding Springs (84629 A). Gustave J. Horak. Ills. 1200 w. Machy—March, 1918. Describes device and its use.

Steel

Bluing Steel (87229 A). W. B. Greenleaf. Ills. 2000 w. Machy—July, 1918. Materials, arrangements and methods used on light sheet-steel work.

Steel Cables

The Manufacture and Testing of Cast Steel Chain Cables (88850 A). 3000 w. Engr—Aug. 16, 1918. Memorandum issued by Lloyd's Register of Shipping.

Steel-Cutting

Oxy-Acetylene Steel Cutting (83196 A). William Herron. Ills. 3500 w. Weld Engr—Dec., 1917. Cutting action of oxygen, design of torches, methods, etc.

Steel Sheets

The Manufacture of Steel Sheets (84-917 A). Clement F. Poppleton. Ills. 4500 w. Iron Age—March 14, 1918. Serial, 1st part. General layout and range of product.

Steel Tubing

See same heading under Aeronautics.

Stoves

The Evolution of Cooking and Heating Stoves. (83410). Ills. 3000 w. Fndry—Jan., 1918. Early attempts in stove making.

Tapping Machines

Tapping Machines and Attachments (82782 A). Franklin D. Jones. Ills. 9 pp. Machy—Dec., 1917. Types, methods, and auxiliary appliances.

Taps

Taps and Tapping Equipment (82127 A). Franklin D. Jones. Ills. 10000 w.

Taps and Dies

Machy—Nov., 1917. Modern developments in design; types of tap-holding chucks.

Taps and Dies

Taps and Dies for Production Work (88853 A). G. Doorakkers. Ills. 2000 w. Engr—Aug. 23, 1918. Serial, 1st part. Details of work, and examples.

Tempering

Time Effect in Tempering Steel (84350 D). A. E. Bellis. 600 w. A I M E, Bul—Feb., 1918. Its importance when a maximum drawing effect is desired. Tests.

Tool Design

Technical vs. Practical Tool Designers (83054). Donald A. Baker. Ills. 1800 w. Am Mach—Dec. 13, 1917. Encouragement for the practical designer.

Tool Design in the Manufacture of Munitions (82778 A). 3500 w. Machy—Dec., 1917. Account of changes made in a Canadian plant, economies effected, lessons taught by experience, etc.

Tool Lubrication

Emulsion Lubrication of Cutting Tools (88632 A). J. A. De Cew. 1300 w. Am Mach—Sept. 5, 1918. Problems of tool lubrication and how emulsifying agents are used.

Tool-Rooms

Efficient Tool-Room System (85709 A). 1200 w. Iron Age—April 18, 1918. Method used in shop of Kempsmith Mfg. Co., Milwaukee. Centralized grinding and systematized collection and delivery of cutting tools.

Tools

Results of Faulty Tool Designing (87236 A). F. B. Jacobs. Ills. 1000 w. Machy—July, 1918. Reasons for failures of tools and fixtures.

The Manufacture of High-Speed Tools (86860 B). Ills. 10 pp. Cas Eng Mthly—May, 1918. Serial, 1st part. Articles on British Key industries, dealing with the technical aspect and also with the organization.

Combustion Tools and Their Application (83083 A). Ills. 1000 w. Machy—Feb., 1918. Tools for performing a series of operations at one setting.

Making Oil-Well Tools in California (82567). Ills. 2500 w. Am Mach—Nov. 22, 1917. Manufacture of large pipe tongs described.

Tool Steel

Manufacture of Electric Tool Steel (85158). E. A. Suverkrop. Ills. 4500 w. Am Mach—Feb. 28, 1918. Methods of manufacture in the electric furnace.

Tool Works

Elimination of Chatter Marks From Machined Work (88325 A). Ills. 4000

MACHINE WORK AND FOUNDRIES**Welding**

w. Am Mach—Aug. 22, 1918. Steps that will eliminate this difficulty.

A New Tool Works at Timperley (83076 A). Ills. 1200 w. Engr—Nov. 30, 1917. Details of works for manufacture of twist drills.

Trade-Marks

Methods of Trademarking Your Product (87879 A). Edward K. Hammond. Ills. 6500 w. Machy—Aug., 1918. Functions of trademarks and how to apply those of the maximum value.

Trade-Marks and the Manufacturer (83966). Glenn B. Harris. 2500 w. Am Mach—Jan. 31, 1918. Arguments in favor of trade-marks.

Treasure Chest

The Old-Time Iron Treasure Chest (83988 A). Alexander E. Outerbridge, Jr. Ills. 2500 w. Iron Age—Jan. 31, 1918. Recent interesting discovery in Philadelphia. Methods of manufacture.

Turning Machine

Large Crank Pin Turning Machine (84146 A). Ills. 1200 w. Engr—Jan. 18, 1918. Details of a machine built in Manchester, England.

Type Bars

Manufacture of Type Bars for a Typewriter (82173). Frank A. Stanley. Ills. 3000 w. Am Mach—Nov. 1, 1917. Punching and grinding operations described.

Typewriters

Making Typewriter Parts (83787). M. E. Hoag. Ills. 1000 w. Am Mach—Jan. 24, 1918. Serial, 1st part. Interesting milling and grinding fixtures are described in present number.

Waste-Heat Boilers

The Waste-Heat Boiler for Malleable Furnaces (86012). Arthur D. Pratt. Diagrams. 5000 w. Fndry—May, 1918. Theory of this unit and advantages of its application in malleable cast iron foundries.

Welded Pipe

The Manufacture of Welded Pipe (88228 A). S. A. Hand. Ills. 1500 w. Am Mach—Aug. 15, 1918. Some methods used in the plant of the National Tube Co., McKeesport, Penn.

Welded Tires

Microscopic Study of Welded Tires (84186 A). S. W. Miller. Ills. 2500 w. Ry Mech Engr—Feb., 1918. Showing dangers of the practice.

Welding

Metallic Electrode Arc Welds (88540 A). O. S. Eschholz. Ills. 2000 w. Weld Engr—Aug., 1918. Suggestions for determining the quality of the joint.

Welding

MACHINE WORK AND FOUNDRIES

Welding

Selection and Application of Electric Arc Welding Apparatus (89012 A). A. M. Candy. Ills. 5000 w. Elec JI—Sept., 1918. Chief requisites for electric arc welding, discussing the electrical equipment and its application.

The Welding of Iron and Steel (88869 N). W. H. Cathcart, with discussion. Ills. 25 pp. West Scot I & S Inst, JI—April, 1918. Welding as carried on at the smith's fire and the forge furnace.

Welding a Large Alligator Shear Frame (88627). J. H. Rodgers. Ills. 1000 w. Pwr House—Aug., 1918. Interesting repair by the thermist welding process.

Arc Welding of Mild Steel (87293 A). O. H. Eschholz. Ills. 2200 w. Elec JI—July, 1918. Operating factors which determine reliable welds.

Fusion Welding Fallacies (87233 A). S. W. Miller. Ills. 1500 w. Machy—July, 1918. Serial, 1st part. Reviews erroneous opinions.

Metallic Electrode Arc Welds (87439 A). O. S. Eschholz. Ills. 2000 w. Ry Mech Engr—July, 1918. Suggestions for determining the quality of the joint.

Oxy-Acetylene Welding (87838 B). George B. Malone. 8 pp. Prof Mem—July-Aug., 1918. Properties of oxygen, and of acetylene, etc.

The Manufacture of Oxygen and Its Use for Welding and Metal-Cutting (87923). J. M. Christie. 1000 w. Eng & Con—July 31, 1918. From Pro. Instn of Mech Engrs. (Eng.) The mechanical production of oxygen and its uses.

Unusual Tension Welding (87842 A). Ills. 700 w. Weld Engr—July, 1918. Details of work at a Chicago shop.

Welding Propellers in Panama Canal Foundry (88019). John M. Moffett. Ills. 1200 w. Fndry—Aug., 1918. How blades are repaired by burning-on, with a comparison of costs.

Mechanically Operated Cutting and Welding Torches (86661 A). Edward K. Hammond. Ills. 5000 w. Machy—June, 1918. Explains methods of using and their applications.

Recent Progress in Electric Welding (86741). T. G. McKay, with discussion. Ills. 5000 w. Naut Gaz—June 8, 1918. Read before the Liverpool Eng. Soc. Advantages of recent methods.

Boiler Welding (85234 A). Ills. 1800 w. Weld Engr—March, 1918. Progress in field of boiler repairs.

Electric Welding Stops Leaks in Girth Seams (85011). Romeo A. Grise. 1300 w. Power—March 19, 1918. Leakage due to fire-cracks at the seam over the fire.

Notes on Welding Systems (84941 N). James Caldwell, with discussion. Ills. 33 pp. Instn E & S Scot, Trans—Feb., 1918. Nature of processes, grouping them under smith welding and fusion welding.

Thermit Welding and Oxy-Acetylene Welding (85235 A). J. H. Deppeler. Reprinted from *Reactions*. 2500 w. Weld Engr—March, 1918. Their respective fields and applications.

Welding and Cutting Processes in Boiler Work (84743). A. F. Dyer. 2500 w. Pr House—Feb., 1918. Read before Can. Ry. Club. Value of acetylene and electric systems.

Welding in Gas Main Construction (84620 A). M. S. Clark. 1800 w. Weld Engr—Feb., 1918. Advantages explained.

Welding Locomotive Cylinders (85232 A). B. Kopperschmidt. Ills. 1500 w. Weld Engr—March, 1918. The problem of quick repairs.

A Counter Attack on German Vandalism (83994 B). Ills. 2500 w. Mar Rev—Feb., 1918. Account of repairs to wrecked German ships.

Oxy-Acetylene and Electric Welding (84079 A). 1500 w. Ry & Loc Eng—Feb., 1918. Abstract of paper by A. F. Dyer, before Can. Ry. Club.

Some Structures in Steel Fusion Welds (84352 D). S. W. Miller. Ills. 18 pp. A I M E, Bul—Feb., 1918. Unusual structures encountered in the examination of welds.

Some General Applications of Electric Welding Process (86099). Ills. 1200 w. Mar Eng, Can—April, 1918. Shows its widening field of usefulness.

Thermit Welding (86254 A). R. L. Browne, with discussion. Ills. 58 pp. N Y Rd Cb, Pro—Apr. 19, 1918. History and description of the process, its applications, etc.

The Welding of Carbon Tools (86445 A). B. Kopperschmidt. Ills. 1800 w. Weld Engr—May, 1918. Methods used in successfully reclaiming broken tools.

Modern Methods of Welding (86452 A). Ills. 1400 w. Nature—Apr. 11, 1918. Use of water-gas for welding large pipe. Electric arc welding also described.

See *Welding*, pages 129, 146, 189.

Oxy-Acetylene Welding (89622 B). George B. Malone. Ills. 11 pp. Prof

Westinghouse Plant MACHINE WORK AND FOUNDRIES Worm-Gearing

Mem—Sept.-Oct., 1918. As taught at the engineering school, Washington Barracks.

Electric Arc Welding Applied to Cast Iron (85403). B. W. Bowers. Ills. 1800 w. Fndry—April, 1918. Methods applied.

Comparison of Forge, Oxy-Acetylene and Electric Welding (83424 A). 1800 w. Machy—Jan., 1918. Essential factors in forge welding and their importance in the other processes.

Rehabilitating the Interned German Ships 83444 D). E. P. Jessop. Ills. 3000 w. Iron Age—Jan. 3, 1918. (Special No.) The part of electric welding in repairing the damaged ships—109 damaged vessels put in service in less than eight months.

Welding Transformer Tanks by Electric Arc Process (83417 A). Erik Oberg. Ills. 3000 w. Machy—Jan., 1918. Methods developed by the Pittsfield works of the General Electric Co.

Useful Data for Spot Welding Work (82469). Lucien Haas. Ills. 2200 w. Am Mach—Nov. 15, 1917. Details of various operations.

British Welders and the World War (83194 A). Frank Mynott. 1500 w. Weld Engr—Dec., 1917. Applications of welding to war work.

Repairing German Vandalism by Electric Welding (83015 F). E. P. Jessop. Ills. 4000 w. Am Soc Nav Engrs, J1—Nov., 1917. Details of work successfully carried out by electric welding.

Electric Arc Welding (82777 A). Erik Oberg. Ills. 18 pp. Machy—Dec., 1917. Principles of this process and the field for which it is best suited.

Welding Cast Iron with the Electric Arc (83197 A). Robert E. Kinkad. 1000 w. Weld Engr—Dec., 1917. Suggestions for successful work.

Heat Production in the Electric Arc (83195 A). Otis Allen Kenyon. Ills. 800 w. Weld Engr—Dec., 1917. Results of tests.

Welding (82896 B). Charles Hollup, with discussion. Ills. 33 pp. A S R E, J1—Nov., 1917. Methods, preparation, tests, and practical examples of welding refrigerating machinery.

See also *Metal Cutting*, pp. 126, 250.

Welding Main Engine Cylinders (83016 F). H. G. Knox. Ills. 2000 w. Am Soc Nav Engrs, J1—Nov., 1917. Work on the German ships "Neckar," "Rhein" and "Bulgaria."

Westinghouse Plant

The New Westinghouse Plant (88485). Ills. 2500 w. Pwr Pt Eng—Sept. 1, 1918.

Details of Essington works, near Philadelphia. Employs both isolated plant and central station service.

Westinghouse Works

South Philadelphia Works of the Westinghouse Company (86570 A). Ills. 3000 w. Ind Man—June, 1918. Features of a new plant to build power-plant machinery, at Essington, Pa.

Wheels

Manufacture and Use of Chilled Iron Wheels (84934 N). F. K. Vial, with discussion. Ills. 50 pp. N E Rd Cb—Feb. 12, 1918. Physical properties that make it of value for wheel service, etc.

Wigglers

Wigglers and Their Uses (89033 A). Hugo F. Pusep. Ills. 1200 w. Am Mach—Sept. 26, 1918. Uses to which wigglers may be applied for much work usually performed by use of buttons.

Wire

Designing Passes for Wire Rod Mill Roll Train (89242 A). W. S. Standiford. 3800 w. Am Mach—Oct. 3, 1918. Design of the passes and the difficulties encountered.

The History of Wire Manufacture (82291 A). 1500 w. Engr—Oct. 19, 1917. Abstract of address by Jos. Phillips Bedson on developments in this field.

Wire-Drawing (82682). 1300 w. Times Engng Supp—Oct. 26, 1917. Progress of the industry in England related in address to Manchester Association of Engineers.

Wire Ropes

History of Wire Hoisting Ropes with Notes on Factors of Safety (82349). 4000 w. Eng & Min J1—Nov. 10, 1917. Materials used; nature and effect of strains, etc.

Woodworking

Value of Flywheels in Woodworking (86201). David R. Shearer. 1000 w. Elec Wld—May 11, 1918. Have proved especially desirable in plants where individual motor drives are installed.

Work-Benches

Design and Construction of Work-Benches (86663 A). Frank H. Mayoh. Ills. 3000 w. Machy—June, 1918. Bench legs and tops; portable work-benches.

Worm-Gearing

Worm-Gearing (82543 A). F. J. Bo-stock. 1000 w. Mech Wld—Nov. 2, 1917. Serial, 1st part. Factors which render the manufacture a precision accomplishment.

MATERIALS OF CONSTRUCTION

Alloys

Acetic Acid

Industrial Developments Relating to the Manufacture of Acetic Acid and Acetone (89356 A). Harold Hibbert. Ills. 3000 w. Chem & Met Eng—Sept. 25, 1918. Demand for explosives led to production from molasses, alcohol, and from calcium carbide.

Aeroplane Timber

Advance Rot and Latent Defects in Aeroplane Timber (86920). J. S. Boyce. 3000 w. A A Wkly—June 17, 1918. Discusses types of wood destroying fungi and defects an inspector must recognize.

Alcohol

Alcohol from Sulphate-Pulp Waste Liquor (85362 A). Ellwood Hendrick. Ills. 1200 w. Met & Chem Eng—April 1, 1918. Plant of the W. Va. Pulp & Paper Co., at Mechanicsville, N. Y.

Alcohol in the Arts and Industries (89321 A). E. H. Leslie. 2500 w. Chem & Met Eng—Oct. 1, 1918. A review of its wide use.

Power-Alcohol (84996 A). 1000 w. Aus Min Stan—Feb. 14, 1918. Serial, 1st part. Alcohol as a fuel.

Alloys

Alloys of Aluminum and Copper (83125). Charles Vickers. Ills. 1000 w. Brs Wld—Dec., 1917. Their use for castings.

Engineers Non-Ferrous Alloys (82866 A). W. Rawlinson. Read before Jun. Inst. of Engrs. 1500 w. Mech Wld—Nov. 23, 1917. Serial, 1st part. Theory and constitution of alloys.

The Formation of Graphite in the Iron-Carbon Series of Alloys (89149 A). J. E. Hurst. Ills. 2500 w. Engng—Aug. 30, 1918. Results of investigations.

The Relative Corrosion of Alloys (89283 A). R. B. Fehr. 2500 w. A S M E, JI—Oct., 1918. Methods previously employed for corrosion tests and a proposed method for indicating relative corrodibility.

Ulco Hard Metal (89382 A). Francis C. Frary and Sterling N. Temple. 1500 w. Chem & Met Eng—Sept. 28, 1918. Alloy developed by the United Lead Co., its test, characteristics, uses, etc.

Industrial Processes for the Speedy Analysis of Alloys (88716 A). James R. Downie. 4000 w. Aust Min Std—July 18, 1918. On processes suitable for the works analyses of alloys.

Alloy Metals, Production and Uses, Especially in Relation to the War (82188 B). George K. Burgess. 1200 w. JI Ind of Eng Chem—Nov., 1917. Notes on observations made abroad.

Brass Rolling Mill Alloys (82445 F). R. A. Wood. 3000 w. A I Mt, JI—Sept., 1917. Mixtures and their characteristics.

The Electrical Properties of Some High Resistance Alloys (82441 F). M. A. Hunter and F. M. Sebast. Curves. 2500 w. A I Mt, JI—Sept., 1917. Investigation of the electrical properties of alloys forming solid solutions.

Metallurgy of Titanium Ferro-alloys (82604). Robert J. Anderson. 4000 w. Eng & Min JI—Nov. 24, 1917. Development, evolution, and present practice. Practical suggestions.

The Hardness of Alloys of Non Ferrous Metals (87697). P. Ludwik. Abstract translation from *Zeit. des Ver. Deut. Ing.* 1200 w. Brs Wld—July, 1918. Results of tests.

Eutectic Alloys (84531 N). Clifford W. Nash. Ills. 3000 w. Chem Eng & Min Rev—Jan., 1918. Serial, 1st part. A study of the structure of metals.

Ocluded Gases in Ferrous Alloys (84374 B). Gellert Alleman and Charles J. Darlington. 37 pp. Fkn Inst, JI—Feb., 1918. Serial, 1st part. Reviews work of investigators.

Report of Sub-Committee III on Sand-Cast Metals and Alloys (85078 N). Ills. 13 pp. Am Soc Test Mats, Pro—June, 1917. Results, with descriptive letters from different authorities on results obtained.

Ocluded Gases in Ferrous Alloys (85722 B). Gellert Alleman and Charles J. Darlington. Ills. 20 pp. Fkn Inst, JI—April, 1918. Research work and conclusions.

On Lead-Tin-Antimony Alloys (85538 A). O. W. Ellis. 700 w. Engng—March 15, 1918. Read before Inst of Metals, London. Investigations.

The Constitution of the Copper Rich Aluminum-Copper Alloys (85535 A). J. Neill Greenwood. Ills. 6000 w. Engng—March 15, 1918. Serial, 1st part. Account of research work.

Interesting Things in Metallurgical Chemistry (85980 A). C. W. Starker. Ills. 1800 w. Machy—May, 1918. The eutectic alloy and changes occurring in metals and alloys when cooling.

Notes on Non-Metallic Inclusions in Bronze and Brass (85925 N). G. F. Comstock. Ills. 2500 w. A I Mt, JI—March, 1918. Work on castings of copper, brass, or bronze to determine the characteristic appearance of each kind of inclusion.

Aluminum**MATERIALS OF CONSTRUCTION****Bronze**

Stellite (86306 A). Elwood Haynes. Ills. 1800 w. *Met & Chem Eng*—May 15, 1918. Report on the physical and chemical properties of alloys of cobalt, chromium, tungsten, and molybdenum.

Aluminum

Metallography of Aluminium (84275 A). Robert J. Anderson. Ills. 3000 w. *Met & Chem Eng*—Feb. 15, 1918. Methods for satisfactory preparation and etching of aluminium microsections and discussion of microstructure.

See same heading under *Machine Works and Foundries*.

L'Industrie Et Les Grandes Applications (83942 B). J. Escard. Ills. 5700 w. *Le Genie Civil*—Dec. 1, 1917. Industrial applications of aluminum and its various alloys.

Recently Developed Uses of Aluminum in Industry (82799). F. G. Shull. 1200 w. *Fndry*—Dec., 1917. Read before Am. Inst. of Metals. Ability to weld and roll aluminum extended its application.

The Changes in Physical Properties of Aluminum with Mechanical Work (82963 N). F. J. Brislée, with discussion. Also, a Note on the Annealing of Aluminum. Richard Seligman and Percy Williams. 9 pp. *Faraday Soc. Trans*—June, 1917. Second part. Deals with specific heat of aluminum.

Ammonia

Recovering Ammonia at Tar-Distilling Plants (84958 A). Clarence R. Woodward. 2500 w. *Met & Chem Eng*—March 15, 1918. Shows that it may be profitably recovered.

Analyses

The Analyses of Brass or Bronze and Babbitt (84413 N). E. W. Haymaier. 10 pp. *A I Mt*, *Jl*—Dec., 1917. Methods found satisfactory for commercial analyses.

Asbestos

L'Amiante Et Ses Applications Modernes (87131 B). A. Renouard. Ills. 3200 w. *La Nature*—May 25, 1918. Asbestos and its present day uses, sources of supply, etc.

Axle Steel

The Science of Preparing Car Axle Steel (82771). W. L. Allen. Ills. 3500 w. *Elec Ry Jl*—Dec. 1, 1917. Analysis of causes of failure and discussion of special treatment to eliminate weaknesses.

Babbitt

Notes on Babbitt and Babbitted Bearings (88213 D). Jesse L. Jones. Ills. 7 pp. *A I M E*, *Bul*—Aug., 1918. Ex-

periments carried out in the chemical laboratory of the Westinghouse Electric and Manufacturing Co., Pittsburgh, Pa.

Bakelite

Fabricated Bakelite Materials (82153 A). Ray P. Jackson, with discussion. Ills. 3500 w. *S A E*, *Jl*—Oct., 1917. Its characteristics and applications.

Bearing Metals

Conservation of Tin in Bronze Bearing Metals (89648 A). G. H. Clamer. Extract from paper read before Inst. of Metals Div. of A. I. M. E., Milwaukee, Oct. 9, 1918. 2500 w. *Am Mach*—Oct. 24, 1918. Explains how this unnecessary use of tin involves waste.

Boiler Plates

A Cause of Failure in Boiler Plates (87387 N). Walter Rosenhain. Ills. 11 pp. *Ir & Lt Inst*—May, 1918. An account of a failure which presents features of importance which may afford a clue to a cause in other cases.

On Certain Failures of Steel Boiler Plates Under Pressure (86811 N). Sidney A. Houghton, with discussion and correspondence. Ills. 38 pp. *West Scot I & S Inst*, *Jl*—Jan.-Feb., 1918. Failures are described and discussed.

Brass

Topical Discussion on Season and Corrosion Cracking of Brass (86997 N). Ills. 25 pp. *Am Soc Test Mat*—June, 1918. Speakers are William Campbell, W. H. Bassett, W. Reuben Webster, W. R. Woodward, and W. B. Price.

Travail Du Laiton A Froid (86472 B). H. Bertin. Ills. 3200 w. *Genie Civil*—Apr. 6, 1918. A formula for determining dimensions of tools for drawing, rolling and stamping brass.

The Volatility of the Constituents of Brass (85926 N). John Johnston. 3500 w. *A I Mt*, *Jl*—March, 1918. Research work on the vapor pressure of metals.

Brass Pipe

Dezincification of Brass Pipe (82764 A). Edward B. Story. Ills. 1500 w. *Met & Chem Eng*—Dec. 1, 1917. Failure due to the dissolution of zinc as a result of electrolysis.

Bronze

Constitution and Hardness of Aluminum Bronze (87291). J. Neill Greenwood. Ills. 1200 w. *Fndry*—July, 1918. Abstract of paper read before Inst. of Metals. (Eng.) Investigations.

Manganese in Aluminum Bronze (87695). Charles Vickers. Ills. 1200 w. *Brs Wld*—July, 1918. Appears to toughen the alloy. Gives tests showing influence.

MATERIALS OF CONSTRUCTION

Fireproofing

Bronzes

The Use of Bronzes in Railroad Turntables and Movable Bridges (84412 N). O. E. Selby. 10 pp. A I Mt, JI—Dec., 1917. Conditions and requirements, discussing specifications.

Worm Gear Bronzes (85916 B). W. M. Corse. Ills. 2500 w. S A E, JI—April, 1918. Brief review of the history of bronze and a study of the metallurgy of bronzes.

Castings

Copper Castings for Electrical Purposes (84495 N). G. F. Comstock. Ills. 2000 w. Am El-Chem Soc, Trans—Oct., 1918. Reviews history of attempts and difficulties and gives results of using silicon as a dioxidizer.

Cast Iron

The Addition of Steel to Cast Iron (88613 A). J. E. Hurst. 1500 w. Engr—Aug. 2, 1918. On the use of steel scrap in pig iron mixtures melted in the cupola.

Cast Iron at High Temperatures (87752). 1000 w. Power—July 23, 1918. Tests collected by the Vulcan Soot Cleaner Co.

Malleable Cast Iron (87465 N). T. Turner, with discussion and correspondence. Ills. 25 pp. West Scot I & S Inst, JI—March, 1918. Processes used in the production, etc.

Cement

Recent Developments in the Cement Industry (89370 A). Richard K. Meade. Ills. 3500 w. Chem & Met Eng—Sept. 27, 1918. Economics effected in fuel and labor, and recovery of potash.

Silica Cement (87002 N). Robert J. Montgomery. Ills. 12 pp. Am Soc Test Mat—June, 1918. Covers in a general way the subjects of composition and testing.

Ceramics

Chemical Stoneware (89374 A). A. Malinowsky. Read before Am. Inst. of Chem. Engrs. 3000 w. Chem & Met Eng—Sept. 27, 1918. Preparation and selection of materials, acid-resisting tests, and annealing ware.

Recent Developments in Ceramics (89369 A). A. V. Bleininger. 3000 w. Chem & Met Eng—Sept. 27, 1918. Development of porcelain and chemical stoneware industries.

The Chemical Stoneware Industry and the War (89371 A). Percy C. Kingsbury. 2500 w. Chem & Met Eng—Sept. 27, 1918. Expansion of the American industry. Domestic materials equal to imported.

Chains

Tests of Cast Steel Anchor Chain (87192 A). Ills. 1000 w. Mar Rev—July, 1918. New casting process, with report of tests.

Coatings

Report of Committee D-1 on Preservative Coatings for Structural Materials (86994 N). Ills. 27 pp. Am Soc Test Mat—June, 1918. Reports and recommendations.

Condenser Tubes

Condenser Tube Failure—Photomicrography (85044 F). F. W. Sterling. Ills. 800 w. Am Soc Nav Engrs, JI—Feb., 1918. Usefulness of the photomicrograph in diagnosing the course of condenser-tube leaks.

Corindite

On the New Refractory and Abrasive Matter Called Corindite (87346 A). Alexandre Bigot. Read before the Ceramic Soc. 1000 w. Engng—May 31, 1918. Studies of interest to the metallurgical industries of the Allies.

Cotton

The Work of the Imperial Institute in Connection with British Cotton Cultivation (89001 N). 10 pp. Imp Inst, Bul—Jan.-March, 1918. Information on aspects of cotton production, with list of special reports and articles bearing on the subject.

Some Applications of Research to the Cotton Industry (86342 A). W. Lawrence Balls, with short discussion. 13 pp. Roy Soc Arts, JI—May 3, 1918. A study of the cotton crop, with special reference to Egypt.

La Catonicultura Nella Colonia Eritrea (86460 B). V. Peglion. Ills. 5200 w. L'Industria—Mar. 15, 1918. Cotton raising in one of Italy's colonies in Africa, and the cost of raw cotton to Italian industry.

Les Ressources Cotonnières De Nos Colonies (86459 C + D). P. Bourdard. 20,000 w. Bul Soc D'Encouragement Pour L'Industrie Nationale—Jan.-Feb., 1918. Cotton available in the French colonies.

Electrical Porcelain

Experimental Investigation of Porcelain Mixes (84759 A). G. I. Gilchrest and T. A. Klinefelter. Ills. 3500 w. Elec JI—March, 1918. The requirements, investigations, and conclusions of a research.

Fireproofing

Report of Committee C-5 on Fireproofing (87004 N). 7 pp. Am Soc Test Mat—June, 1918. Proposed standard specifications for fire tests of materials and construction.

MATERIALS OF CONSTRUCTION

Lead

Fuel

Assisting Fuel Administration (84221 A). M. J. O'Connell. 2000 w. Ice & Refrig—Feb., 1918. Read before the Va. Ice Mfrs. Assn., at Richmond. Suggestions.

Fuel Oil

Storage and Handling of Fuel Oil (83-997). Charles L. Hubbard. Ills. 5000 w. Natl Engr—Feb., 1918. Approved method.

Furnace Linings

Notes on the Disadvantages of Chrome Brick in Copper Reverberatory Furnaces (83873 D). Francis R. Pyne. 1000 w. A I M E—Dec., 1917. Points out disadvantages when treating materials too valuable to allow metal absorption.

Ferro-Alloys

The Ferro-Alloys (89376 A). J. W. Richards. 4000 w. Chem & Met Eng—Sept. 28, 1918. Brief description of the manufacture, properties, and uses of the alloys of iron with manganese, silicon, aluminum, chromium, tungsten, molybdenum, vanadium, titanium, boron, and uranium.

Metallurgical Ferroalloys in 1917 (83862). Robert J. Anderson. 2500 w. Eng & Min JI—Jan. 26, 1918. A review of the field.

Ferro-Manganese

Bibliography of the Manufacture of Ferro-Manganese (82761 A). E. C. Buck. 4 pp. Met & Chem Eng—Dec. 1, 1917.

Glass

Home Made Optical Glass (89372 A). H. E. Howe. 4000 w. Chem & Met Eng—Sept. 27, 1918. Growth of the American industry in the past four years.

Industrial Glassware (89373 A). S. R. Scholes. 1500 w. Chem & Met Eng—Sept. 27, 1918. American manufacture stimulated by war conditions.

The Glass Industry as Affected by the War (88450 N). 140 pp. U S Tariff Com—No. 5. A survey of certain aspects of the glass industry with special reference to war changes.

The Manufacture of Optical Glass (88466 A). S. A. Hand. Ills. 2500 w. Am Mach—Aug. 29, 1918. Problems of its manufacture have been solved and the production undertaken in United States.

Glue

Another Grumble About Glue (88362). Dr. W. R. Drushel. 1800 w. A A Wkly—Aug. 26, 1918. Glues for aircraft work are discussed.

A Grumble About Glue (87674). Mervyn O'Gorman. 2500 w. A A Wkly—July 22, 1918. Improvements needed in the product and its use.

Gun-Metal

Admiralty Gun-Metal (89534 A). F. Johnson. Read before the Inst. of Metals. 3500 w. Engng—Sept. 20, 1918. The influence of impurities on the mechanical properties.

Hardening

The Hardening and Tempering of Steel (85418 A). C. A. Edwards. Read before the Manchester Assn. of Engrs. Ills. 4400 w. Engng—March 8, 1918. Considers treatment of carbon steels and special steels.

Hardness

Brinell Test of Hardness (85430 A). Fairfax. 1200 w. Mech Wld—March 15, 1918. Preparation of samples and methods of testing.

Hardness of Soft Iron and Copper Compared (89434 A). F. C. Kelley. Ills. 900 w. Gen Elec Rev—Oct., 1918. Experiments showing that by the electric furnace iron can be annealed to such a degree of softness as to permit its being substituted for copper in many cases of industrial use.

Hoisting Ropes

Length of Service and Care of Hoisting Ropes (86645). 2200 w. Eng & Min JI—June 1, 1918. Proper modulus of elasticity for wire ropes is discussed and comparisons made of ropes of various constructions.

Inspection

Topical Discussions on the Subject of Inspection (83336 A). Papers by A. L. De Leeuw, F. A. Waldron, and B. W. Dunn, with discussion of all three. 11500 w. A S M E, JI—Jan., 1918.

Iron Alloys

Tantiron (88610 A). Ills. 2500 w. Engng—Aug. 9, 1918. The manufacture and qualities of this acid-resisting material.

Iron Protection

Standards for Protective Finishes for Iron (88569). E. P. Later. 3500 w. Fndry—Sept., 1918. Results of tests which indicate the protective qualities of various metals and thicknesses of coatings.

Joints

Joints and Jointing Materials (85305). 3500 w. Engr—March 8, 1918. Considers plastic, sheet and metallic joints.

Lead

L'Emploi De La Pression Plastique Du Plomb (86473 B). M. Lunet. Ills. 2400 w. Génie Civil—Apr. 6, 1918. Use of the plasticity of lead to transmit pressure in certain operations in forming metals.

MATERIALS OF CONSTRUCTION Rare-Earth Industry

Leather

The Australian Leather Industry (89113 A). C. T. Stephenson. Ills. 3000 w. Aust Min Std—Aug. 22, 1918. Description of sole leather manufacture in Australian tannery.

Lubricants

Report of Committee D-2 on Lubricants (86985 N). 5 pp. Am Soc Test Mat—June, 1918. Recommendations.

Keeping Power Plant Oil in Good Condition (86882). Harley Lett Smith. 2500 w. Elec Ry J1—June 15, 1918. Discussion of care of oil in steam turbine power stations.

Lubricating Oils

Standardized Specifications for Lubricating Oils (84549 B). C. W. Stratford. Ills. 4500 w. S A E, J1—Feb., 1918. Recommended specifications based on extensive tests.

Machine Tools

Foreign Machine Tool Demands (82399 A). 3500 w. Ry Mech Engr—Nov., 1917. Yearly output of American builders tripled; demand expected to continue after war.

Responsibility of Machine Tool Builders (82470). Henry Japp. Ills. 3500 w. Am Mach—Nov. 15, 1917. Address by the Deputy Director General in United States for British Minister of Munitions.

Magnesia Bricks

The Refractory Properties of Magnesia (84017 A). H. Le Chatelier and B. Bogitch. 600 w. Colly Gdn—Jan. 11, 1918. From *Acad. des Sci.* Resistance of magnesia bricks. Results of tests.

Metal Coatings

Report of Sub-Committee II of Committee A-5 on Preservative Metallic Coatings for Metals (85077 N). 34 pp. Am Soc Test Mats, Pro—June, 1917. Investigations and results, with short discussion.

Metals

Grain Growth in Metals (89533 A). Zay Jeffries. Read before Inst. of Metals. Ills. & Plates. 4500 w. Engng—Sept. 20, 1918. Serial, 1st part. A study of the general laws of grain growth.

The Effects of Impurities on Metals (87489 N). Clifford W. Nash. 3300 w. Chem Eng & Min Rev—May, 1918. Influence upon the physical and mechanical properties.

Metal Structure

The Amorphous Metal Hypothesis and Equi-cohesive Temperatures (84409 N). Zay Jeffries, with discussion. Ills. 25 pp. A I Mt, J1—Dec., 1917. Discussion

of the crystalline structure of metals and the amorphous metal hypothesis.

Molding Sand

Iron Oxide—Its Effect on Molding Sand (83406). W. R. Bean. Read before Am. Fndry. Assn. 1500 w. Fndry—Jan., 1918. Tests indicate that percentages over 3.5 per cent in sand are detrimental.

Muntz Metal

Typical Cases of the Deterioration of Muntz Metal (60:40 Brass) by Selective Corrosion (83961). Henry S. Rawdon. Ills. 35 pp. U S Bur Stnds. Tech paper 103—Dec. 15, 1917. Illustrated by four types, including tubings, sheets, and forgings.

Natural Resources

See same heading under CIVIL ENGINEERING, *Materials of Construction.*

Nitric Acid

Development in Nitric Acid Manufacture in the United States Since 1914 (89355 A). E. J. Pranke. 1800 w. Chem & Met Eng—Sept. 25, 1918. Nine-fold increase in production.

Non-Ferrous Metals

Report of Committee B-2 on Non-Ferrous Metals and Alloys (86995 N). 63 pp. Am Soc Test Mat—June, 1918. Proposed specifications and methods.

Testing Engineers Discuss Nonferrous Metals (87289). 3000 w. Fndry—July, 1918. Considers specifications for babbitt metal and bronze bearings, for turntables and other movable railroad structures.

Optical Instruments

The Properties and Testing of Optical Instruments (88258). 40 pp. U S Bur Stds, Circ. No. 27—Aug. 9, 1918. Classification, properties, testing, etc.

Ordnance Inspection

Building Up the Ordnance Inspection Department (84098). Glenn B. Harris. 1200 w. Am Mach—Feb. 7, 1918. Information in regard to the work involved.

Paper

Une Culture Intensive De Pâte A Papier (87129 B). L. De Launay. Ills. 2700 w. La Nature—May 18, 1918. A new source of paper pulp from eucalyptus plantations in Spain.

Pig-Iron

Pig-Iron From Scrap-Steel (83320). Ills. 1200 w. Min and Sci Pr—Dec. 29, 1917. Synthetic pig-iron; production from scrap metal in the electric furnace.

Rare-Earth Industry

The American Pyrophoric-Alloy Industry (89378 A). Alcan Hirsch. 2500 w. Chem & Met Eng—Sept. 28, 1918. Development of the rare-earth industry in connection with Welsbach mantles.

Consult Classification of the Index. See page 9.

MATERIALS OF CONSTRUCTION

Rubber

Refractories

Refractories from the Scientific Standpoint (88954). Charles Catlett. 1000 w. Mfrs Rec—Sept. 19, 1918. Value of these materials.

Refractory Materials—A General Discussion (82964 N). Introductory address by Sir Robert Hadfield. Ills. 188 pp. Faraday Soc, Trans—June, 1917. Papers, discussions, bibliography, etc.

Research on Refractory Materials (83081 A). G. E. Foxwell. 2000 w. Ir & Cl Trds Rev—Nov. 23, 1917. Study of brick burning.

Carborundum Refractories (89375 A). S. C. Linbarger. 3000 w. Chem & Met Eng—Sept. 27, 1918. Comparative account of silicon carbide refractories with those in general use.

Relative Volatilities of Refractory Materials (89450 N). William Roy Mott. 34 pp. Am Chem Soc—Oct., 1918. A study of the order in which substances volatilize in the electric arc, and the distances at which their vapors condense from the arc.

Native Supplies of Refractory Materials in the Sheffield District (87407 A). W. G. Fearnside. 2500 w. Ir & Cl Trds Rev—May 24, 1918. Summary account of local supplies of value.

Refractory Materials Research Committee's Report (87412 A). 2200 w. Ir & Cl Trds Rev—June 14, 1918. Serial, 1st part. First of a series of reports on the general properties of refractory materials.

Silica Products—I. Raw Materials (87406 A). A. Bigot. Abstract of paper before the Ceramic Soc. 1800 w. Ir & Cl Trds Rev—May 17, 1918. Serial, 1st part. Analytical, physical and micrographic studies.

Refractory Materials Used in Casting Plants (86777). H. C. Arnold. 4000 w. Fndry—June, 1918. Serial, 1st part. Application of acid, basic, and neutral refractories, and tests for silica brick.

Refractories (87155). 1200 w. Times Engng Supp—May, 1918. Extension of home supplies. Abstract of paper by W. J. Jones before Ceramic Society.

Report of Committee C-8 on Refractories (87000 N). 8 pp. Am Soc Test Mat—June, 1918. Proposed revisions in tentative methods for ultimate chemical analysis, and method for determination of porosity.

The Necessity for Inspection and Testing of Refractory Brick (87001 N). C. E. Nesbitt and M. L. Bell. Ills. 9 pp. Am Soc Test Mat—June, 1918. Lack of uniformity of product shows the necessity.

On the Testing of Refractory Materials (82140 A). J. W. Mellor. Read before the Ceramic Soc., Glasgow. 3000 w. Engng—Oct. 12, 1917. Urges standardization of methods. See page 267.

Refractories (82680). 2000 w. Times Engng Supp—Oct. 26, 1917. Increase in demand and output reported by British Ceramic Society.

Refractories and Modern Kilns (82143 A). J. G. Maxwell. Read before the Ceramic Soc., Glasgow. 3000 w. Engng—Oct. 12, 1917. Types of kilns suitable for burning firebricks and fireclay blocks, and types of fuel for firing them.

A Furnace for Testing Refractory Materials Under Load at High Temperatures (83594 A). Robert J. Montgomery. Ills. 1000 w. Met of Chem Eng—Jan. 1, 1918. A gas furnace which has been used successfully at the Koppers Co. laboratory.

Some Physical Properties of Acid Refractory Materials and Methods for Estimating Them (86391 A). G. E. Foxwell. Ills. 3500 w. Ir & Cl Trds Rev—Apr. 12, 1918. The more important physical properties of firebricks, with methods employed for measurement.

The Problems of Refractories (86481). 2000 w. Times Engng Supp—Apr. 26, 1918. Properties of silica; its different forms; presence of iron; effect of carbon, etc., etc.

Refractory Brick

Slag Test for Refractory Brick Used in the Iron and Steel Industry (85081 N). C. E. Nesbitt and M. L. Bell. 900 w. Am Soc Test Mat, Pro—June, 1917. Tests and results.

Ropes

Considerations in the Selection and Use of Hoisting Ropes (83189). H. C. Behr. 3300 w. Eng & Min J—Dec. 22, 1917. Discussion on factors of stress and safety.

History of Wire Hoisting Ropes with Notes on Factors of Safety (82753). M. H. Sigafos. 4500 w. Cl Age—Dec. 1, 1917. History and suggestions.

The Factor of Safety of Wire Ropes Used for Winding in Mine Shafts (83218 N). J. A. Vaughan, with discussion. 9000 w. S Af Instn Engrs, J—Nov., 1917. Methods of estimating strength, etc.

Rubber

Science and the Rubber Industry (87393 A). J. Bretland Farmer, with discussion. 8000 w. Roy Soc Arts, J—June 21, 1918. Services rendered by science in the production of raw rubber, and future possibilities of assistance.

Russian Timber

MATERIALS OF CONSTRUCTION

Steel

The Rubber Embargo (87247 A). Andrew H. King. Ills. 4000 w. Chem & Met Eng—July 1, 1918. Economic effects of reduced rubber supply; reclaiming old stock; use of guayule as a local source of natural substitute.

Report of Committee D-11 on Rubber Products (87005 N). 15 pp. Am Soc Test Mat—June, 1918. Proposed tentative specifications for braided leader hose, rubber belting, and steam hose.

Rubber Substitutes (86898 A). Andrew H. King. Ills. 5500 w. Met & Chem Eng—June 15, 1918. Factors and limitations to be considered in studying rubber substitutes.

Rubber and Jelutong (84957 A). Frederic Dannenrth. 2500 w. Met & Chem Eng—March 15, 1918. Review of the evidence in the recent Customs House dispute as to classification of gums.

The Vulcanization of Rubber (84722 A). Andrew H. King. 5400 w. Met & Chem Eng—March 1, 1918. Theory and practice are discussed in detail.

Effect of Copper on Crude Rubber (82786 B). Charles P. Fox. 1200 w. J1 Ind & Eng Chem—Dec., 1917. Results of tests.

The Production and Preparation of Raw Rubber (82837 A). Ills. 4500 w. Engr—Nov. 9, 1917. Serial, 1st part. Deals with plant and machinery made by British firms. Rubber bearing plants, collection of rubber latex, etc.

Defects in Industrial Rubber Goods (86303 A). Frederic Dannenrth. 3000 w. Met & Chem Eng—May 15, 1918. Glossary of defects with suggestions as to cause and prevention.

Russian Timber

Les Richesses Forestières De La Russie (83906 B). C. Rabot. 1400 w. La Nature—Dec. 1, 1917. Estimate of the timber resources of Russia.

Salvage

Salvage at the Winchester Plant (88441 A). Charles M. Horton. Ills. 2500 w. Ind Man—Sept., 1918. How scrap and waste material is reclaimed and utilized at a munition-making plant.

Sand

Moulding Sand (82546 A). R. Robertson. 1000 w. Mech Wld—Nov. 9, 1917. Essential properties; sands suitable for different kinds of work, etc.

Molding Sands, Facing Sands and Blackings (85686 A). S. G. Smith. 1800 w. Mech Wld—March 29, 1918. Serial, 1st part. Their composition, requirements, etc.

The Occurrence and Testing of Foundry Moulding Sands (84515 N). L. Heber Cole. Ills. 27 pp. Can Min Inst, Trans—1917. Field work and conclusions from tests.

Schoop Process

Vom Schoop'schen Metallspritzverfahren (84583 B). Ills. 1700 w. Schweizerische Bauzeitung—Dec. 29, 1917. Methods and apparatus for use with the Schoop metal spraying process for protecting surfaces.

Screw Gages

Inspection of Screw Gages for Munitions of War (83423 A). Abstract of pamphlet by H. J. Bingham Powell. Ills. 5000 w. Machy—Jan., 1918. Measurement of pitch, and of full, effective, and core diameters.

Specifications

Government Specifications for Testing and Inspecting Metallic Materials (82320). Ills. 2000 w. Am Mach—Nov. 8, 1917. Adopted by the International Aircraft Standards Board, Washington, D. C.

Standardization

Report of the Committee on Standardization of Flanges and Pipe Fittings (89288 A). Ills. & Tables. 500 w. A S M E, J1—Oct., 1918. Recommendations outlined.

Steel

No Sweeping Curtailment of Steel for Automobiles (86888). 2500 w. Auto Ind—June 13, 1918. War needs filled first. Full text of pig iron and steel agreement.

Report of Committee A-1 on Steel (86984 N). 50 pp. Am Soc Test Mat—June, 1918. Recommendations affecting standards and tentative standards.

Sur L'Hétérogénéité Des Aciers (87116 C + D). G. Charpy and S. Bonnerot. Ills. 1000 w. Revue De Métallurgie—Mar.-Apr., 1918. Micrographs showing heterogeneity of steel composition and molecular structure.

Tensile Strength and Hardness of Steel (88754 A). H. M. Brayton. 1000 w. Iron Age—Sept. 12, 1918. Their relation shown by means of graphical charts.

Sur L'Hétérogénéité Des Aciers (87115 C + D). H. Le Chatelier and E. L. Dupuy. Ills. 1100 w. Revue De Métallurgie—Mar.-Apr., 1918. Heterogeneity of steels. Illustrations of metallic structure by means of micrographs.

Selecting Steel by the Spark Method (87075 A). J. D. Keller, in *Blacksmith and Wheelwright*. Ills. 3500 w. Mech Wld—June 7, 1918. Methods used in

Steel Plates

MATERIALS OF CONSTRUCTION

Waste

selecting steel, and faults of some of them; how to make the spark test, its use, etc.

The Hardening and Tempering of Steel (84829 A). C. A. Edwards. Read before Manchester Assn. of Engrs. 2500 w. Mech Wld—March 22, 1918. Serial, 1st part. Carbon, and nickel steels are discussed in present article.

Les Points Critiques De Refroidissement Des Aciers Auto-Trempants (84591 C+D). M. P. Dejean. Ills. 7500 w. Revue De Métallurgie—Sep.—Oct., 1917. Critical cooling points of self-tempering steels, and the formation of Troostite and Martensite.

Steel Plates

The Action of Caustic Liquors on Steel Plates (83394 A). C. E. Stromeyer. 2500 w. Engng—Dec. 14, 1917. Experiments showing the seriousness of the action of caustic soda.

Steels

Specifications for Aircraft Steels (87521 A). 2500 w. Iron Age—July 11, 1918. Review of the address of Albert Ladd Colby.

Steels for Gears and Their Treatment (87196 A). George A. Richardson. Ills. From a paper before the Drop Forge Assn. 3000 w. Iron Age—June 27, 1918. Discusses materials available, the uses to which they are best adapted, the character of heat-treatment, etc.

Stellite

The Development of Stellite (89414 A). Elwood Haynes. Ills. 1200 w. Iron Age—Oct. 10, 1918. Melting problems solved by Snyder electric furnaces.

Stellite (82449 F). Edward Haynes. 2000 w. A I Mt, JI—Sept., 1917. An alloy made to resist the oxidizing influences of the atmosphere, and its uses.

Deloro Smelting & Refining Co., Ltd., Deloro, Ont. (86319). Ills. 4500 w. Can Fndman—May, 1918. The home of stellite—a non-ferrous alloy of cobalt and other metals.

Storage

The Need for Storage Facilities (83246). Francis Lee Stuart. 1200 w. Ry Age Gaz—Dec. 28, 1917. Address at meeting of the Acad. of Pol. Sci. Recommendations of Terminal Port Facilities Committee and Storage Committee of the War Industries Board.

Substitutes

Substitutes in Germany (88842 A). 2500 w. Eng Rev—Aug., 1918. Serial, 1st part. Shows the difficulties under which the enemy is laboring in industry, from the lack of raw materials.

Sulphuric Acid

Sulphuric Acid and the War (86453 A). T. E. Thorpe. 1100 w. Nature—Apr. 11, 1918. Uses in war, new sources, etc.

Calumet & Arizona Sulphuric-Acid Plant (85373). Courtenay De Kalb. Ills. 4000 w. Min & Sci Pr—March 30, 1918. Outline of process of acid manufacture, etc.

Large-Scale Sulphuric Acid Manufacture (89357 A). Andrew M. Fairlie. Ills. 4500 w. Chem & Met Eng—Sept. 25, 1918. Plant of the Tenn. Copper Co. Noteworthy features of this largest plant in the world.

The Sulphuric Acid Situation in the United States (83600 A). Lewis B. Skinner. 4500 w. Met of Chem Eng—Jan. 15, 1918. Information, including a discussion of the future of the industry.

Textiles

Report of Committee D-13 on Textile Materials (86988 N). 20 pp. Am Soc Test Mat—June, 1918. Proposed tentative general methods for testing, with regulations governing the committee on this subject.

The Moisture Content of Textiles and Some of its Effects (82919 A). William D. Hartshorne. Ills. 53 pp. A S M E—Dec., 1917. Develops a set of laws governing regain in cotton and worsted. Charts and tables.

Timber

Wood Preservation—The Preservative Treatment of Highway Bridge Timber (87650 A). Kurt C. Barth. 1500 w. Eng Soc Minn, Bul—July, 1918. Discusses means of prolonging the life of timber.

Report of Committee D-7 on Timber (86982 N). 9 pp. Am Soc Test Mat—June, 1918. Reports on wooden paving blocks and on timber preservatives.

Tin

Economies in Use of Tin (87197 A). 1200 w. Iron Age—June 27, 1918. Suggestions for conservation of tin. Substitutes.

Tool Steels

Détermination Du Meilleur Mode D'Emploi Des Aciers A Outils (84605 B). P. Denis. Ills. 4800 w. Le Génie Civil—Jan. 5, 1918. Tests on tool steels.

Tool Steels (88301). 800 w. Can Fndman—Aug., 1918. Outlines the cause of hardening and effect of tempering on carbon steels.

Waste

The Utilization of Waste Products (88791 A). 2200 w. Aust Min Std—July

Wood

18, 1918. Serial, 1st part. Detinning of waste tin plate, or recovery of tin from tin plate scrap in present number.

Wood

See same heading under Aeronautics.

Wool

The Australian Wool Industry (88792 A). 1500 w. Aust Min Std—July 18, 1918. Serial, 1st part. The knitting trade in New South Wales.

MEASUREMENT**Boiler Stress****Wrought Iron**

Report of Committee A-2 on Wrought Iron (86983 N). 13 pp. Am Soc Test Mat—June, 1918. Recommendations and comments.

Zinc Dust

The Evaluation of Zinc Dust: A Proposed Method of Analysis (86996 N). L. A. Wilson. 14 pp. Am Soc Test Mat—June, 1918. From the viewpoint of its metallic zinc content.

MEASUREMENT**Aeroplanes**

L'Essai Des Matériaux Servant à La Construction des Aeroplanes (89701 B). Ills. 3600 w. Génie Civil—Sept. 7, 1918. Testing devices and machines for aeroplane parts.

Air Compressors

Testing Air Compressors (87896 A). A. S. Tennant. Ills. 2000 w. Engng—July 5, 1918. Some test results of a 4,000-cu. ft. Belliss and Morcom air-compressor.

Testing an Air-Compressor (86238 A). Walter S. Weeks. Ills. 1500 w. West Eng—May, 1918.

Testing an Air Compressor (85496). Walter S. Weeks. Ills. 1700 w. Min & Sci Pr—April 6, 1918. Volumetric efficiency by orifice test; illustrative examples and charts.

Air Metering

Displacement Tanks for Metering Compressed Air (85271). Walter S. Weeks. Ills. 900 w. Com Air Mag—March, 1918. Description.

Airplane Wings

Transverse Testing Under Non-Uniformly Distributed Load With Special Application to Airplane Wing Ribs (86991 N). Irving H. Cowdrey. Ills. 19 pp. Am Soc Test Mat—June, 1918. Methods of testing are described.

Alignment

Alignment Charts (84633 A). George L. Hedges. 2500 w. Machy—March, 1918. Explains principles governing construction and illustrates use.

Aluminum Sheets

The Testing of Aluminum Sheets (87617 A). Robert J. Anderson. 1500 w. Iron Age—July 18, 1918. Data on the annealing of similar 14-gage sheet aluminum.

Anemometers

Calibration of Anemometers (83108). A. H. Anderson. Ills. 600 w. Ht & Vt

Mag—Dec., 1917. Gives data showing that the method of calibrating anemometers by swinging in a short radius is quite erroneous.

Balancing

Enter the "Balancing Engineer" (83286 A). N. W. Akimoff. 700 w. Ind Man—Jan., 1917. Need of the balancing engineer, kind of training required, and his work.

Recent Development in Balancing Apparatus (82703 A). N. W. Akimoff. Ills. 2500 w. A S M E, J1—Dec., 1917. Improvements, and a new machine based on new methods of balancing. Results secured.

Recent Developments in Balancing Apparatus (83979 A). Ills. 2000 w. Machy—Feb., 1918. New form of dynamic balancing machine.

Balancing Machine

The Carven Dynamic Balancing Machine (85984). G. Douglas Wardrop. Ills. 3000 w. A A Wkly—Apr. 29, 1918. Principle and construction of the machine, with general notes.

Ballistics

Internal Ballistics (87344 A). 1200 w. Engng—May 31, 1918. Abstract of lecture by A. G. Hadcock, at the Royal Instn. Account of the fundamental problems from the engineer's point of view, and recent advances made.

Blower-test Curves

Plotting Blower-Test Curves (82928 A). A. H. Anderson. Ills. 6 pp. A S M E—Dec., 1917. Another method and its application to problems.

Boiler Stresses

Calculation of Boiler Stresses (84862 A). G. E. Parks. 1500 w. Ry Mech Engr—March, 1918. Series of diagrams that will save time and labor in figuring strength and efficiency of seams.

MEASUREMENT

Dynamometers

Bolts

Stresses in Bolts in Fulcrum Brackets (88996 A). V. M. Summa. Ills. 800 w. Mech Wld—Aug. 30, 1918. Serial, 1st part. General principles involved in the design with analysis of typical cases.

Bolt Stresses

Stresses in Bolts in Fulcrum Brackets (84864 A). Victor M. Summa. Ills. 1000 w. Ry Mech Engr—March, 1918. Analyzes typical cases showing general principles involved.

Brass

Thermal Expansion of Alpha and of Beta Brass Between 0-600° C., in Relation to the Mechanical Properties of Heterogeneous Brasses of the Muntz Metal Type (84415 N). P. D. Merica and L. W. Schad. Ills. 12 pp. A. I. Mt—Dec., 1917. Investigation and results.

Calculator

A Logarithmic Calculator (83219 N). D. R. Robinson. Ills. 1000 w. Chem, Met, & Min Soc of S Af, J1—Sept., 1917. Describes instrument and its use.

Calorimeters

Some Points Regarding Calorimeter Efficiency (88901 B). Walter P. White. 2500 w. Fkn Inst, J1—Sept., 1918. Considers sources of calorimetric error and the advantages of different types of instrument.

An Aneroid Calorimeter for Specific and Latent Heats (86031 A). Nathan S. Osborne. Ills. 25 pp. U S Bur Stds—Apr. 6, 1918. Designed for measurement of heats of a certain class of materials adapted for use in artificial refrigeration.

Compressive Tests

Compression Tests on Tubular Struts (87518 N). P. F. Purcell, with discussion. Ills. 20 pp. Instn C E Ireland, Trans—Vol. XLIII, 1918. Results of tests on cylindrical sections.

Condensers

Capitalized Value of One-Tenth of an Inch of Vacuum (82776). C. H. Baker. Charts. 500 w. Power—Dec. 4, 1917. Formulae and charts for calculating the capital that may be economically invested in condenser equipment.

CO₂ Recorders

CO₂ Recorders in the Boiler-House (88286 A). John B. C. Kershaw. Ills. 3500 w. Engr—July 19, 1918. Serial, 1st part. Detailed description of automatic gas-testing apparatus for recording CO₂ percentages.

Crankshafts

Analysis of Crankshaft Stresses (82594). Otto M. Burkhardt. Ills. 2500 w. Auto Ind—Nov. 22, 1917. Serial, 1st part. Features of different

bearing layout. Effect of number of cylinders.

Chains

Safe Chain Loads (88499 A). A. Black. 2500 w. Machy—Sept., 1918. Factors that determine safe loads, and effects by annealing chain.

Charts

Alignment Chart for Feeds, Speeds, and Power of Lathe Tools (85171). A. Lewis Jenkins. Chart. 800 w. Am Mach—March 14, 1918. For quickly solving problems by graphical means.

Simple, Rapid Calculating Chart (84-274). Ralph E. Turner. 2000 w. Pwr Pt Eng—Feb. 15, 1918. Combination of logarithmic charts serves purpose of slide rule with equal accuracy and rapidity.

Crushing Strength

Crushing Strength of Magnesia-Silica Mixtures at High Temperatures (85836 N). O. S. Kowalke and O. A. Hougen. Ills. 2000 w. Am El-Chem Soc—April-May, 1918. Investigations, describing apparatus used and explaining theory.

Cylinder Testing

Hydraulic Tester for Gas Storage Cylinders (87339 A). Ills. 1000 w. Engng—May 31, 1918. Plant constructed by James Spurge for rapid and convenient testing.

Differentiation

Mechanical Differentiation (83884 B). Armin Elmendorf. Ills. 2000 w. Frkn Inst, J1—Jan., 1918.

Dilution

Heats of Dilution and Their Variations with Temperature (86313 B). Frank R. Pratt. Ills. 33 pp. Fkn Inst, J1—May, 1918. Research work and apparatus.

Drills

Efficiency Tests of Rock-Drill Accessory Equipment (88281 A). Charles F. Willis. Ills. 4500 w. Eng & Min J1—Aug. 17, 1918. Conclusions from tests made with a stopper-type machine drill and Paynter testing apparatus.

Ductility

Erichsen Tests on Aluminum Sheets (85549 A). Robert J. Anderson. 1200 w. Iron Age—April 11, 1918. How this method is applied to determine ductility and regulate annealing.

Dynamometers

Commercial Dynamometers (86244 A). P. Field Foster. Ills. 1800 w. Mech Wld—Apr. 26, 1918. Serial, 1st part. Describes some of the commercially applicable types.

A 900 Hp. Dynamometer Installation (88809). Ills. 1000 w. Auto Ind—Sept. 12, 1918. Features of interest in the new test house of the Duesenberg Motors Corp.

MEASUREMENT

Hardness

Elastic Limit

Sumner Elastic Limit Recorder (86992 N). J. L. Jones and C. H. Marshall. Ills. 6 pp. Am Soc Test Mat—June, 1918. A semi-automatic solenoid device and method of operation.

Equilibrium Diagram

The Iron Carbon Equilibrium Diagram and Its Practical Usefulness (86582 N). H. C. H. Carpenter. Ills. 24 pp. Instn Nav Archts—March 21, 1918. Aims to show how the diagram has been constructed, and its practical usefulness to the engineer.

The Iron-Carbon Equilibrium Diagram and Its Practical Usefulness (86212 A). H. C. H. Carpenter. 6500 w. Engng—Apr. 12, 1918. Serial, 1st part. Shows how the diagram has been constructed and illustrates its practical use.

Explosives

Method of Calculating Comparative Strength and Efficiency of High Explosives from Their Composition and Apparent Densities (86763 B). Charles E. Waller. 3500 w. J1 Ind & Eng Chem—June, 1918. Method often useful in making up a formula for an explosive to be used for a certain class of work.

Flumes

Flow Conditions in Flumes (82513). John S. Longwell. Curves. 1000 w. Can Engr—Nov. 15, 1917. Shows that where water flows at high velocity investigations should be made before final designs are adopted.

Fusion Apparatus

Some Notes on Fusion Apparatus (83002 A). Frederick Pope. Ills. 2500 w. Met & Chem Eng—Dec. 15, 1917. Design and construction of several types of autoclaves and fusion kettles.

Gages

Rules for Computing Gage Tolerances (89108 A). D. Douglas Demarest. Ills. 1500 w. Ind Man—Oct., 1918. Simple rules for calculating the tolerance of limit gages, with comments on gage design.

Flush-Pin Versus Limit Gages (88227 A). Albert H. Dowd. Ills. 1000 w. Am Mach—Aug. 15, 1918. Types are described and examples given.

Indicating Fixtures for the Gaging of Automobile Parts (88231 A). Albert A. Dowd. Ills. 2200 w. Am Mach—Aug. 15, 1918. Details of special gaging fixtures used.

Gases in Metals

A Precision Method for the Determination of Gases in Metals (86977 N). H. M. Ryder. 6 pp. Am El Chem Soc—April, 1918. Details of method for measuring and analyzing the gas.

Gaging

Developing a Gaging System for Small Arms and Heavy Ordnance (89185 A). Erik Oberg. Ills. 12500 w. Machy—Oct., 1918. Serial, 1st part. Principles involved and procedure followed in system for interchangeable manufacture.

Gas Interferometer

Gas Interferometer Calibration (87564 A). Junius David Edwards. 5 pp. U S Bur Stds—June 24, 1918. Gives a proposed method.

Gas Temperatures

Measuring the Temperature of Gases in Boiler Settings (88712). Henry Kreisinger and J. F. Barkley. 60 pp. U S Bur Mines—Bul 145. Information as to the accuracy of temperature measurements made under certain conditions and the corrections that can be safely applied.

Gauges

Precision Gauges (83088 A). H. J. Rickwood. 2200 w. Mech Wld—Nov. 30, 1917. Principles involved, types, etc.

Gauge Testing

Optical Projection Apparatus for Testing Gauges (86223 A). Ills. 1500 w. Engr—Apr. 19, 1918. Details of projection apparatus and the requirements and use.

Gears

Measuring Gears by the Use of Wires (88230 A). William S. Hudson. Ills. 900 w. Am Mach—Aug. 15, 1918. Explains principles involved.

Strength of Spiral-Type Bevel Gears (87877 A). Reginald Trauttschold. Ills. 3500 w. Machy—Aug., 1918. Formulas for determining strength of spiral-type bevel gears and principles upon which they depend.

Graphical Methods

Graphical Methods of Finding Centres of Gravity and Resultants (85429 A). W. W. Padfield. 1000 w. Mech Wld—March 15, 1918. Serial, 1st part. Method described and illustrated by examples.

Gravity

The Value of "g" in Engineering and Physical Work (86001 A). Sanford A. Moss. Map. 9 pp. Gen Elec Rev—May, 1918. Effect of variations in the intensity of gravity, with data for corrections.

Guns

Long Range Artillery Calculation (86365 A). George Greenhill. 2000 w. Engng—Apr. 26, 1918. Methods of calculating long range fire.

Hardness

Report on Hardness Testing: Relation Between Ball Hardness and Scleroscope Hardness (89551 N). A. F. Shore, with introduction and comments by Sir Rob-

Hardness

ert Hadfield. Ills. 16 pp. Ir & St. Inst—Sept., 1918.

The Definition of Hardness (86707 A). W. Cawthorne Unwin. 700 w. Engng—May 17, 1918. Shows the identity of Martel's and Brinell's hardness numbers.

A New Method of Obtaining Brinell Hardness (87032 N). J. G. Ayers, Jr. Ills. 6 pp. Am Soc Test Mat—June, 1918. Results obtained in an endeavor to design a new type for commercial testing.

A Simple Type of Brinell Testing Machine for 500 Kg. Load (86990 N). A. V. de Forest. Ills. 11 pp. Am Soc Test Mat—June, 1918. Description, measurements, and suggestions.

Heat Meters

Les Compteurs Calorimétriques (88426 B). R. Joessel. Ills. 2600 w. Génie Civil—July 6, 1918. Serial, 1st part. Development of meters for steam and hot water.

High Pressures

Measuring High Pressures with Dead Weight (84539). Sanford A. Moss. Ills. 2200 w. Power—Feb. 26, 1918. Details for using the equivalent of the dead-weight pressure-gage tested for measuring pressures during tests.

High Temperatures

Automatic Control and Measurement of High Temperatures (83981 A). Abstract of paper by Richard P. Brown, read before the Faraday Society. Ills. 2200 w. Machy—Feb., 1918. Improvements in measuring instruments and control devices.

Impact

Impact Testing (89508 A). E. P. Gooch. Ills. 1800 w. Elec JI—Oct., 1918. Details of a testing machine and the work done with it, discussing results.

The Resistance of Metals to Penetration Under Impact (89331 A). C. A. Edwards. Read before the British Inst. of Metals. Ills. 4500. Engng—Sept. 13, 1918. Including a note on the hardness of solids.

Impact Test

The Impact Test of Materials (82541 A). Howard Ensaw. Ills. 600 w. Mech Wld—Nov. 2, 1917. Suggestions, describing the Stanton machine.

Indicator Diagrams

The Theoretical Indicator Diagram (88984). O. A. Malychevitch. 2500 w. Auto Ind—Sept. 19, 1918. Serial, 1st part. Method of predetermining the gas temperatures and pressures for various points in the engine cycles of the charge and the physical properties of the components.

MEASUREMENT**Lenses****Industrial Gases**

Measuring Gas Electrically (87183 N). J. C. Wilson, with discussion. Ills. 152 pp. Assn I S E E—March, 1918. Economic features underlying the large quantity measurement of industrial gases.

Instruments

Contour- and Radius-Measuring Instrument (86664 A). Ills. 1500 w. Machy—June, 1918. Universal type for measuring irregular profiles, radius gages, and contours that cannot be tested by ordinary devices.

Predicting Instruments (87184 B). Ills. 14 pp. U S Art, JI—Jan-April, 1918. Descriptions, plans, and photographs of predictors, which have been recently submitted for test.

Power Plant Instruments as an Investment (82118). M. A. Saller. 2200 w. Pr Pt Eng—Nov. 1, 1917. Serial, 1st part. When is it advantageous to purchase instruments, showing operating conditions?

Joints

Simplification of Riveted Joint Design (88369 B). H. A. S. Howarth, with discussion. 52 pp. Engrs' Soc W Penn, Pro—May, 1918. A study of the method of calculating joint efficiencies published in the Report of the Boiler Code Committee of the A. S. M. E.

The Shearing Resistance of Nailed Joints (82410 A). Henry F. Blood. 1000 w. Ore Soc Engrs, JI—Oct., 1917. Tests and results.

Laboratories

Standardization of Rare-Metal Thermocouples (85359 A). Paul D. Foote, T. R. Harrison and C. O. Fairchild. Ills. 5000 w. Met & Chem Eng—April 1, 1918. First of two articles dealing with the pyrometer laboratory for industrial purposes.

Les Laboratoires Sidéurgiques Modernes (87732 B). A. Cornu-Thénard. Ills. 3500 w. La Nature—June 1, 1918. Serial, 1st part. Equipment of French laboratories for testing steel specimens.

American Water Works Laboratories (87592 N). Jack J. Hinman, Jr. Tables. 9 pp. Am W-Wks Assn, JI—June, 1918. Information concerning work done and conditions.

Laboratory

The Hydraulic Laboratory of the Massachusetts Institute of Technology (85050 B). George Edward Russell. Ills. 1500 w. Bos Soc C E, JI—March, 1918. Facts and descriptions.

Lenses

Axial Aberrations of Lenses (87559 A). E. D. Tillyer and H. I. Shultz. Ills. 29 pp. U S Bur Stds—June 24,

Lubricants

1918. Discusses errors which affect the definition of a lens, and describes methods of representing graphically the central errors.

Lubricants

The Testing of Lubricants (88229 A). Raymond Francis Yates. Ills. 1500 w. Am Mach—Aug. 15, 1918. Simple tests for lubricating oils and greases.

Lubricant Testing (83019 F). G. J. Meyers. Ills. 2500 w. Am Soc Nav Engrs, JI—Nov., 1917. Describes a machine for investigating the desirable characteristic of lubricants.

Machine Stresses

Stresses in Machines When Starting or Stopping (86191 A). F. Hymans. (Abstract.) Ills. 2500 w. A S M E, JI—May, 1918. Method for their determination, taking account of inertia and elasticity.

"Mass"

The Much Abused Term "Mass" in Engineering Calculations (86241 A). Carl Hering paper discussed by John C. Trautwine, Jr., with reply by Carl Hering. 2500 w. E Cb Phila, JI—May, 1918.

Measuring Machine

Measuring Templets and Screw Threads With a Microscopic Measuring Machine (85976 A). Franklin D. Jones. Ills. 1500 w. Machy—May, 1918. Construction and adjustment of measuring machine and application for testing accuracy.

Mechanical Hysteresis

Study of Mechanical Hysteresis Will Advance Our Knowledge of Materials (86618). Frederick J. Schlink. 3000 w. Eng News-Rec—May 30, 1918. Failure under repeated stress apparently related to loss of energy in stress.

Metric System

A Case for the Adoption of the Metric System (and Decimal Coinage) by Great Britain (84822 N). A. J. Stubbs. 5000 w. Instn E E JI—Feb., 1918. History of the system and its advantages and disadvantages.

The "Pros and Cons" of the Metric System (84821 N). Llewellyn B. Atkinson. 6000 w. Instn E E, JI—Feb., 1918. Discussion of the real issues, with suggestions for reconciling conflicting views.

Micrographs

Report of Committee E-4 on Magnification Scales for Micrographs (86081 N). 4 pp. Am Soc Test Mat—June, 1918. Suggested amendments to the tentative definitions and rules governing the preparation of micrographs of metals.

Nomograms

Nomogram for the Properties of Compressed Air (87263). M. J. Eichhorn.

MEASUREMENT

4000 w. Natl Engr—July, 1918. Construction and examples of use.

Nozzles

The Divergence of Steam Nozzles (83130 A). Gerald Stoney. 400 w. Engng—Dec. 7, 1917. Method of calculation.

Oil Tanks

Calculating the Contents of Oil Tanks (83723). R. T. Strohm. Ills. 1000 w. Power—Jan. 22, 1918. Methods of obtaining measurements.

Orifice Discharges

Orifice Discharges for Saturated Steam (82119). L. A. A. Karl. 900 w. Pr Pt Eng—Nov. 1, 1917. Chart designed to simplify necessary calculations.

Permeability

The Measurement of the Permeability of Iron Stampings by Ewing's Double Bar and Yoke Method (85683 A). Frank Shaw. Ills. 3000 w. Elec'n—March 22, 1918. Experiments undertaken to demonstrate the applicability of Ewing's method to the determination of the permeability of laminated specimens of steel.

Photo-Elasticity

See Machine Elements, under Machine Elements and Design.

Photomicrography

Note on a Telescopic Focussing Apparatus for Photomicrography (89544 N). A. F. Hallimond. Ills. 500 w. Ir & St Inst—Sept., 1918. Constructional details.

Pitot Tube

Measurement of Air and Gases by the Pitot Tube (84002). A. H. Anderson. Ills. 1200 w. Pwr Pt Eng—Feb. 1, 1918. Tables. Explanation of use.

Measuring Air and Gases with the Pitot Tube (85272). A. H. Anderson. Ills. 5000 w. Instn E E JI—Feb., 1918. History of the system and its advantages and disadvantages.

Power Factor

Obtaining Power Factor by Use of Wattmeter (83686). E. G. Barrington. 1200 w. Elec Wld—Jan. 19, 1918. Explains manner in which power factor on three-phase circuits may be readily obtained.

Power Measurement

Torsion Meter for Power Transmitted by Propeller Shafts (85400). Ills. 2500 w. Mar Eng, Can—March, 1918. Apparatus found satisfactory in measurement of power developed by marine engines.

Power Plants

Power Plant Calculations (83323). W. F. Schaphorst. 2500 w. Natl Engr—Jan., 1918. Chart for determining power of a steam turbine.

Power Plants

MEASUREMENT

Screw Threads

Pyrometers

Les Pyromètres Electriques Industriels (83905 B). E. Coustet. Ills. 1400 w. La Nature—Dec. 1, 1917. Design and use of various forms of electric pyrometers.

Pyrometers and Pyrometry (83690 A). 3500 w. Eng Rev—Dec. 15, 1917. Serial, 1st part. Problems and achievements of modern pyrometry.

Pyrometers, Their Construction and Repair (88748 A). J. A. Lucas. Ills. 3000 w. Am Mach—Sept., 1918. Manufacture and upkeep of a number of types.

Pyrometry

Pyrometers and Pyrometry (88997 N). Ills. 168 pp. Faraday Soc, Trans—June, 1918. General discussion; bibliography.

Pyrometers

The Types and Industrial Uses of Pyrometers (88302). Ills. 3500 w. Can Fndman—Aug., 1918. Illustrated detailed description of types and their uses.

Uses of Pyrometry (83925). 2800 w. Times Engng Supp—Nov. 23, 1917. Temperature measurement in industry; value of scientific methods, automatic temperature control, etc.

Pyrometers and Pyrometry (82967 N). Ills. 50 pp. Faraday Soc—Nov. 7, 1917. Contributions by various authors, to a general discussion. Seven papers.

Pyrometers and Pyrometry (82833 A). 5000 w. Elec'n—Nov. 16, 1917. Serial, 1st part. Four papers read at meeting of Faraday Soc, giving a general discussion of the subject.

Radiation

Determining the Heat Given Off by Engines and Power Piping (87648). E. V. Hill and W. J. Mauer. Ills. 1500 w. Ht & Vt Mag—July, 1918. Tests made in connection with the construction of the new Mayfair pumping station, Chicago. See also page 279.

Radiators

The Electric Method of Testing Radiators (87608 D). J. E. Emswiler. Ills. 9 pp. Am Soc Ht & Vt Engrs, Jl—July, 1918. Method developed at the University of Michigan. Advantages and results.

Rails

Bending or Flexure of Railway Rails (86612). From *Le Genie Civil*. 2200 w. Eng & Con—May 29, 1918. A study of the bending stresses in railway rails, by M. Caufourier, with a new hypothesis.

Record Chart

An Improved Progress-of-Work Chart (86314 B). F. J. Schlink. 700 w. Flm Inst, Jl—May, 1918. Describes a simple

and compact type of running record chart of interest and value to industrial plants and testing laboratories.

Refractories

The Standardization of Tests for Refractory Materials (89548 N). Cosmo Johns. Ills. 32 pp. Ir & St Inst—Sept., 1918. Report of Committee of the Ceramic Society, with introductory remarks.

See also page 259.

Rotating Discs

The Strength of Rotating Discs (88607 A). H. Haerle. 3500 w. Engng—Aug. 9, 1918. Describes a method of ascertaining the distribution and magnitude of stresses which can be applied to any profile, and gives a chart for reducing the mathematical work to a minimum.

Rubber

Volumetric Determination of Free Sulfur in Soft Rubber Compounds (87279 B). H. S. Upton. 1500 w. Ind & Eng Chem—July, 1918. Method and results, conserving time and materials and giving greater accuracy.

Safety Valves

Graphic Method of Determining Size of Safety Valve (88833). H. F. Gauss. Chart. 1500 w. Power—Sept. 17, 1918. Reasons for increasing maximum allowable lifts above those permitted in the A. S. M. E. Code. General solution.

Screw Efficiency

Efficiency of the Screw (89658 B). Benjamin F. Groat. 53 pp. Engrs' Soc W. Penn, Pro—June, 1918. Tables and diagrams for making quick calculations of the performance of screws, and examples illustrating their use.

Screw-Gauges

The Inspection of Screw-Gauges for Munitions of War (84150 A). H. J. Bingham Powell. 2000 w. Mech Wld—Jan. 18, 1918. Serial, 1st part. Present article deals with the measurement of the pitch.

Screw Threads

Measurement of Internal Threads (83421 A). William S. Rowell. Ills. 500 w. Machy—Jan., 1918. Recommends the use of an inside micrometer with ball points to assist in making and gaging internal threads.

Thread Milling (83420 A). Franklin D. Jones. Ills. 13700 w. Machy—Jan., 1918. Advantages of milling process; different methods of forming screw threads by milling; types and designs of milling machines.

Screw-Thread Tolerances for Munitions (83788). Ills. 700 w. Am Mach—Jan. 24, 1918. Tolerances of U. S. S. form of screw threads as established by U. S. Ordnance Dept.

Screw Threads

Projection Method of Testing Screw Threads (85351 A). Franklin D. Jones. Ills. 2800 w. Machy—April, 1918. Projection apparatus as applied to inspection of thread gages for munitions manufacture.

Shafts

Whirling and Whip of a Revolving Shaft (85533 A). G. Greenhill. 3000 w. Engng—March 15, 1918. Serial. 1st part. States the problem and method of investigating, explaining theory.

Shaft Speeds

Critical Speeds of Shafts (89580 A). G. Bonner. 1200 w. Mech Wld—Sept. 13, 1918. Serial, 1st part. Deals with methods of calculating the critical speed.

The Whirling of Shafts (82552 A). H. A. Webb. 1200 w. Engng—Nov. 2, 1917. Serial, 1st part. The problem of calculating the whirling speed. Mathematical.

Slide Rule

Design of Special Slide Rules (83294 A). A. Lewis Jenkins. Ills. 1800 w. Ind Man—Jan., 1918. Third article of a serial giving equations for solution of problems.

Design of Special Slide Rules (82638 A). A. Lewis Jenkins. Ills. 1500 w. Ind Man—Dec., 1917. Second part of article giving systems and equations for the solution of problems.

Speedometer

A Liquid Speedometer (85309 N). William Alexander, with short discussion. Ills. 3500 w. So Af Instn Engrs, JI—Feb., 1918. Detailed description of the instrument, explaining its advantages.

Springs

Abaque Pour Le Calcul Des Ressorts A Boudin (87141 B). R. Vanson. Ills. 3100 w. Génie Civil—May 25, 1918. Curves for calculation of springs under varying conditions of load. Mathematical.

Strength of Helical Springs (88026 A). W. A. Atkinson. Table. 500 w. Mech Wld—May 17, 1918. Useful table giving ready worked-out loads and deflections.

Helical Spring Computations (83422 A). Donald H. Reeves. 5000 w. Machy—Jan., 1918. Charts for determining dimensions and properties of springs in tension and in compression.

Spur Gears

Pin Measurement of Spur Gears (83418 A). Reginald Trantschold. Ills. 2500 w. Machy—Jan., 1918. Principles governing measurement. Formulas.

Steam

Regnault's Latent Heat of Steam Investigations (87549 A). Frank B. As-

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pinall. Ills. 5600 w. Engr—June 21, 1918. Critical discussion of Regnault's results in measuring the latent heat of steam showing his conclusions to be wrong.

Steam Testing

Testing Quality of Steam (85388). W. A. Taller. Ills. 2500 w. Natl Engr—April, 1918. Simple methods of attaching calorimeter and making moisture determinations.

Steel

Rapid Determination of Carbon in Steel by the Barium Carbonate Titration Method (87280 B). J. R. Cain and L. C. Maxwell. 2500 w. JI Ind & Eng Chem—July, 1918. Modification of the barium-carbonate titration method, giving greater rapidity.

The Failure of Short Tubular Struts of High-Tensile Steel (87475 N). William Charles Popplewell and Herbert Carrington. 13 pp. Instn C E, Pro--Paper No. 4210. Experimental results and conclusions from tests made at suggestion of the Royal Aircraft Factory.

The Effect of Annealing on the Electrical Resistance of Hardened Carbon Steels (87278 B). I. P. Parkhurst. 1700 w. JI Ind & Eng Chem—July, 1918. Résumé of previous work, with report of investigations to determine the rate of softening of quenched steels.

Steel Balls

The Elastic Indentation of Steel Balls Under Pressure (86192 A). C. A. Briggs, W. C. Chapin, and H. G. Heil. (Abstract.) 1500 w. A S M E, JI—May, 1918. Experiments and results.

Stresses

Combined Stresses (82914 A). A. Lewis Jenkins. 17 pp. A S M E—Dec., 1917. Possible hypotheses upon which a formula may be based.

Photo-Elasticity for Engineers (83105 N). E. G. Coker. Ills. 25 pp. Instn Aut Engrs—Nov., 1917. Uses and applications shown by examples.

Stresses in Curved Pipes (88172 A). J. S. Henzell. 1500 w. Mech Wld—July 5, 1918. Serial, 1st part. First article considers inferences which are to be considered in curved pipes which suffer no external restraint.

First Principles of Stresses (88165 N). W. Workman. Ills. 2500 w. Per-Way Instn, JI—April, 1918. Deals principally with sling chains and their limits of safety.

Twisting and Bending Moments in Square and Rectangular Bars (85343 A). Victor M. Summa. 300 w. Machy—April, 1918. Derives formulas.

Stresses

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Viscosity

Sulphur Determination

A Standard Apparatus for the Determination of Sulfur in Iron and Steel by the Evolution Method (87282 B). H. B. Pulsifer. Ills. 2500 w. J1 Ind & Eng Chem—July, 1918. Use of the evolution flask and the results and advantages.

Suspended Templets

Suspended Templets and Their Application (83584). Terrell Croft. Ills. 1500 w. Power—Jan. 15, 1908. Their advantages and use and various methods of suspending them.

Tables

Simple Tables Save Mental Labor (83293 A). G. W. Greenwood. 900 w. Ind Man—Jan., 1917. Explains how tables help and how they are made.

Tank Contents

Improved Method for Finding Contents of Cylindrical Tanks (86665 A). Carlo M. Eyster. Ills. 800 w. Machy—June, 1918. Improved chart and its use.

Testing Machine

An Impact-Endurance Testing Machine (83107 F). D. J. McAdam, Jr. Ills. 2000 w. Am Soc Nav Engrs, J1—Nov., 1917. Describes new machine found to give satisfactory results.

Report of Sub-Committee III, of Committee D-13, on Testing Machines (87031 N). Ills. 10 pp. Am Soc Test Mat—June, 1918. Deals with textile testing machines.

Some Continental Testing Machines (86725 A). H. S. Primrose and J. S. Glen Primrose. Ills. 5000 w. Ir & Cl Trds Rev—April 19, 1918. Abstract of paper before the Iron & Steel Inst. Deals with tensile testing machines, torsion testing, impact testing, etc.

Some Useful Testing Machines (86813 N). H. S. Primrose and J. S. Glen Primrose. Ills. 45 pp. West Scot I & S Inst, J1—Jan.-Feb., 1918. Tensile and impact testing machines and their applications.

Testing Methods

Report of Committee E-1 on Methods of Testing (86989 N). Ills. 23 pp. Am Soc Test Mat—June, 1918. Proposed revisions in standard methods. Effect of size and form of specimens.

Textiles

The Moisture Content of Textiles and Some of Its Effects (82257 A). William D. Hartshorne. 4500 w. A S M E, J1—Nov., 1917. Effects on weight, dimensions, strength and elasticity.

Tests

On Testing Materials (82123 A). William Knight. 2500 w. Machy—Nov., 1917. Interpretation of results obtained from various tests.

Thermodynamics

How to Use a Psychrometric Chart (83844). J. I. Lyle. 2000 w. Ht & Vtg Mag—Jan., 1918. Ten typical examples and their solution, based on the Carrier psychrometric chart.

Thermostat

Further Notes on a High-Temperature Thermostat (82287 A). J. L. Haughton and D. Hanson. Read before the Inst. of Metals. Ills. 3200 w. Engng—Oct. 19, 1917. Describes alterations which render the apparatus suitable for temperatures much above 500 deg. C.

Time Charts

Charts Giving Time Required to Hob Spur Gears (87872 A). V. P. Rumely. Charts. 600 w. Machy—Aug., 1918.

Tool Steels

Organisation Scientifique De L'Usinage (85142 B). P. Denis. Ills. 7100 w. Le Génie Civil—Feb. 23, 1918. Serial, 1st part. Researches and tests on tool steel adapted to lathe work, milling and drilling.

Torsion

Torsional Stresses (89186 A). F. W. Salmon. 300 w. Machy—Oct., 1918. Table for use in machine designing, with explanation.

The Use of Soap Films in Solving Torsion Problems (83638 A). A. A. Griffith and G. I. Taylor. Abstract of paper read before Inst. of Mech. Engrs. Ills. 3000 w. Engr—Dec. 21, 1917. Describes experimental method developed.

Torsion Meter

Torsion Meter for Power Transmitted by Propeller Shafts (87208). Ills. 3000 w. Pwr House—June, 1918. Details of apparatus that has proven satisfactory on board ship.

Turbine Blading

Stresses in Turbine Blading (86363 A). Gerald Stoney. 2200 w. Engng—Apr. 26, 1918. Methods used in estimating stresses.

Turbines

Stresses in Turbine Wheels (83982 A). William Knight. Tables. 1200 w. Machy—Feb., 1918. Methods and values for determining stresses.

Twisting and Binding

Combined Twisting and Bending Moments (82779 A). Victor M. Summa. 1500 w. Machy—Dec., 1917. Formulæ and their applications. Mathematical.

Viscosity

Viscosity Determinations in Absolute Units (87398 A). 2200 w. Engng—June 14, 1918. Describes the three oil viscosimeters in widest use, and literature bearing on the subject.

Weights and Measures POWER AND TRANSMISSION**Canada**

The Variable Pressure Method for the Measurement of Viscosity (86999 N). E. C. Bingham. 10 pp. Am Soc Test Mat—June, 1918. Difficulties encountered and advantages to be derived by modifying the present capillary tube viscosimeters so as to use variable pressures.

The Standard Saybolt Universal Viscosimeter (86986 N). Winslow H. Herschel. 10 pp. Am Soc Test Mat—June, 1918. Methods for determining an equation for instruments of standard dimensions.

Standard Substances for the Calibration of Viscometers (86028 A). Eugene C. Bingham and Richard F. Jackson. Ills. 27 pp. U S Bur Stds—Apr. 6, 1918. Research; measurement of viscosity, etc.

Weights and Measures

Report of the Committee on Weights and Measures of the American Society of Mechanical Engineers (88558 A). 10 pp. A S M E, J1—Sept., 1918. Abstract of a report by F. A. Halsey entitled "The Metric System in Export Trade." Unfavorable to the adoption of the metric system.

Water Power

Détermination Des Dimensions Les Plus Avantageuses D'Une Installation De Force Hydraulique (87136 B). E. Baticle. 3000 w. Génie Civil—May 11,

1918. Deduction of mathematical expressions for the best dimensions of the principal elements of an hydraulic plant.

Weighing Scale

Stabilized-Platform Weighing Scale of Novel Design (86140). Frederick J. Schlink. Ills. 26 pp. U S Bur Stds, Tech paper 106—Mar. 12, 1918. Theory and design of a new type of check-stabilized weighing scale, with copy of patent.

Weirs

Verification of the Bazin Weir Formula by Hydro-Chemical Gaugings (83896 D). Floyd A. Nagler. Ills. 52 pp. A S C E, Pro—Jan., 1918. Results of 23 experiments on a standard Bazin weir. Methods of hydro-chemical and weir gauging used.

Wire Gages

Wire Gages (84373). 5 pp. U S Bur Stds, No. 67—Jan. 17, 1918. Combined table of sizes in the principal wire gages.

Wind Recorder

A Simple Automatic Wind-Direction Recorder (86646). James Robertson. Ills. 800 w. Eng & Min J1—June 1, 1918. The apparatus is used in smelter fume investigations.

Worm Gearing

The Strength of Worm-Gearing (84993 A). Howard Ensaw. Ills. 1000 w. Mech Wld—Feb. 15, 1918. Simple method of determining the safe load.

POWER AND TRANSMISSION**Air Compressors**

Lubrication of Air Compressors (89038 A). W. H. Callan. 2500 w. Am Mach—Sept. 26, 1918. Treats of the heat condition of the walls of an air compressor, and gives a series of tests of various oils.

High Pressure Air Compressor Design and Application (86600). Joseph M. Ford. Ills. 4500 w. Mar Eng, Can—May, 1918. Serial, 1st part. Deals with machines which produce high pressure air, and their advantages.

Lubrication of Motor-Driven Air Compressors (82213). Ills. 4500 w. Elec Rev, Chi—Nov. 3, 1917. Requirements of suitbale oil; economy in use of oils, etc.

Air Hose

Economy of Tight Air Hose Connections (82853). Glenn B. Harris. 2000 w. Am Mach—Dec. 6, 1917. Remedies to prevent costly waste of power.

Air Pumps

Air Pumps (83760 A). Ills. 800 w. Engr—Dec. 28, 1917. Investigations on various methods of producing high vacuum.

Ash Handling

Buying an Ash-Handling System (84068). Herbert E. Birch. 2200 w. Power—Feb. 5, 1918. How to purchase a system to remove ashes from boiler ash-pits.

Belting

Belting Problems Discussed at Chicago Meeting (88036). 5500 w. Elec Rev, Chi—Aug. 3, 1918. Discussion of belting and its use.

Belts

Belt Practice (85090). W. F. Schaphorst. 1600 w. Pwr Pt Eng—May 1, 1918. Care of belts; formula for fabric belts.

Bucket-Elevators

Some Practical Hints in Bucket-elevator Operation (84344 D). A. M. Nicholas. 500 w. A I M E, Bul—Feb., 1918.

Canada

Power—Canada's Opportunity (89270). A. M. Beale. 2500 w. Can Engr—Oct. 3, 1918. Industry requires power. What other countries are doing.

Canada's Water Powers and Their Relation to the Fuel Situation (86274). J. B. Challies. Ills. 2500 w Can Min J1—

Cheap Power

May 1, 1918. Extracts from a paper before Can. Soc. of C. E. Discussion of present fuel and power situation.

Cheap Power

The Potentialities of a National Power Scheme (84254 A). Ernest P. Hollis. 5000 w. *Ir & Cl Trds Rev*—Jan. 25, 1918. Read before Assn. of Min. Elec Engrs. The possibility of a supply of cheap power is considered.

Compressed Air

Hog Island Compressed Air Installation (89623). Ills. 1000 w. *Com Air Mag*—Oct., 1918. Detailed description.

Compressed Air and Some of Its Applications (84170 A). Joseph B. Mossman. 14 pp. *Utah Soc Engrs*, J1—Dec., 1917.

Compressed Air to Win War (88899). Frank Richards. 2500 w. *Com Air Mag*—Sept., 1918. Serial, 1st part. Reviews the history of compressed air in its modern uses and adaptations.

Scarcity of Men and Growing Use of Air in Railroad Maintenance (85269). Ills. 1400 w. *Com Air Mag*—March, 1918. Its adaptation to various kinds of work.

Crankshafts

Broken Crankshafts (87541). Maurice M. Clement. 1500 w. *Pwr Pt Eng*—July 15, 1918. Causes and their prevention.

Elevators

Factors Governing Elevator Drive (88352). C. E. Clewell. Ills. 2500 w. *Elec Wld*—Aug. 24, 1918. Standard safety features; power requirements, and types of motors suited to service.

Development of V-Groove Elevator (88553). Charles Reedy. Abstract of paper before Elevator Mfrs. Assn. 3500 w. *Natl Engr*—Sept., 1918. History of experiments, discussing various makes of traction drive.

Operation and Maintenance of Elevators—Arrangement of Cables (86558). R. H. Whitehead. Ills. 1500 w. *Power*—May 28, 1918. Different ways of roping up the winding-drum type of elevator machine for overhead and basement installations.

Energy

The Waste of Energy (89554 A). H. J. Spencer. 800 w. *Aust Min Std*—Sept. 5, 1918. Serial, 1st part. Causes of waste and methods of effecting improvement.

Engines

The Centenary of the Heat Regenerator and the Stirling Air Engine (83388 A). Ills. 3000 w. *Engr*—Dec. 14, 1917. Specifications of Stirling's patent in 1816.

POWER AND TRANSMISSION

India

Forge Shops

Compressed Air for Forge Shops (84880). Charles A. Hirschberg, in *Am. Drop Forger*. Ills. 2000 w. *Com Air Mag*—Feb., 1918. Explains its advantages and use.

Fuel Economy

Saving Coal by Efficient Pulleys (88940 N). Charles H. Machen. Ills. 2000 w. *Am Mach*—Sept. 19, 1918. Discusses loss of power due to belt slip.

Garabed Motor

Why of the Garabed Motor "Mystery"? (88465 A). 800 w. *Ind Man*—Sept., 1918. Editorial on Garabed T. K. Giragossian's mistaken idea.

Gear Drives

Efficiency of Gear Drives (86187 A). C. M. Allen and F. W. Roys. Ills. 1800 w. (Abstract.) *A S M E*, J1—May, 1918. Theory of apparatus used and method of testing.

Great Britain

Water Power in Great Britain (with Special Reference to Scotland): Its Amount and Economic Value (84279 A). Alexander Newlands, with discussion. Map. 19 pp. *Roy Soc Arts*, J1—Jan. 25, 1918.

Hospital Equipment

Engineering Equipment of a Modern Hospital (82997). J. J. Becker. Ills. 1500 w. *Pwr Pt Eng*—Dec. 15, 1917. Dual sources of supply at Danville, Pa., memorial hospital.

Hospital Plant

Cook County Hospital Power Plant (87830). Thomas G. Thurston. Ills. 3000 w. *Natl Engr*—Aug., 1918. Coal saving and improved service by new installation.

Service for the Sick (87846). Ills. 2500 w. *Pwr Pt Eng*—Aug. 1, 1918. Details of modern power plant at Blodgett Memorial Hospital, Grand Rapids, Mich.

Hotel Equipment

For the Comfort of the Guest (82396). Ills. 1700 w. *Pr Pt Eng*—Nov. 15, 1917. Equipment for Hotel Deshler, Columbus, O.

Hydraulic Jacks

Hydraulic Jacks: Their Use and Maintenance (84994 A). G. H. Boot. Ills. 1500 w. *Mech Wld*—Feb. 15, 1918. Serial, 1st part. Troubles due to lack of care.

India

Water Power in India (86697 A). Alfred Dickinson, with discussion. 7500 w. *Roy Soc Arts*, J1—May 17, 1918. Schemes already developed and possible water powers are briefly considered.

POWER AND TRANSMISSION

Power Estimates

Indicators

Transmitting Crosshead Motion to the Indicator (85987). C. E. Anderson. Ills. 1800 w. Pwr Pt Eng—May 1, 1918. Directions for making reducing motion.

Lubrication

Lubricating Air Compressors (84725 A). From a paper before the Lubricating Engrs' Assn. 2500 w. Ry & Loc Eng—March, 1918. Requirements, quality of oil, etc.

Lubrication of Ball Bearings (85155). Otto Bruenauer. Ills. 4000 w. Am Mach—Feb. 21, 1918. Serial, 1st part. Characteristics of oils and greases as affecting lubrication, with suggestions.

Lubrication of Air Compressors (87950). W. H. Callan. 2500 w. Cl Age—Aug. 1, 1918. Discusses air cylinder lubrication.

Lubrication of Air-Compressor Cylinders (88119). W. H. Callan. 2000 w. Power—Aug. 13, 1918. Résumé of experience showing that a light mineral oil, and little of it, is best lubricant.

The Lubrication of Michell Blocks (87761 A). 1200 w. Engng—June 28, 1918. Results of experimental research.

Air-Compressor Lubrication (85689 A). From *Lubrication*. 2500 w. Mech Wld—April 5, 1918. External and internal lubrication, characteristics of lubricants, methods of applying oil, etc.

Lubrication of Mine Machinery (84521 N). James A. Boyd. 2500 w. Can Min Inst, Trans—1917. Different phases of the subject.

A Simple Problem in Forced Lubrication (83377 A). Lord Rayleigh. Ills. 700 w. Engng—Dec. 14, 1917. Maintaining the layer of lubricant between the opposed solid surfaces.

Economy in Lubricating Materials (83697 A). 1800 w. Mech Wld—Jan. 4, 1918. Serial, 1st part. Storing lubricants, lubricating devices, consumption, etc., are discussed.

Lubrication of Air Compressors (83045 A). Abstract of article in *Lubrication*. 2500 w. Ry Mech Engr—Dec., 1917. Problems encountered, and characteristics of oil to be used.

Michell's Automatic Lubricating Gear (83064 A). Ills. 2000 w. Engng—Nov. 23, 1917. New type of apparatus developed for the purpose of lubricating bearings during starting and stopping.

Merits of Oil and Grease Lubrication (83187). W. J. Fouhy. 2000 w. Elec Rev, Chi—Dec. 22, 1917. Free flowing oil gives best lubrication.

Lubricators

Lubricators—Their Construction and Maintenance (86821 A). Ills. 1800 w.

Ry & Loc Eng—June, 1918. Care of automatic appliances necessary.

Oil-Burning Plant

Tamarack Mills Power Plant (85237). Charles H. Bromley. Ills. 1500 w. Power—March 26, 1918. Chief features of a new oil-burning plant at Pawtucket, R. I. See *Oil Engines and Fuel*, pp. 192 and 279.

Oil Reclaimers

Centrifugal Oil Reclaimers (87552 A). Ills. 700 w. Engr—June 21, 1918. Detailed description of the Spratt oil subdivider and its operation.

Operation Records

Power Plant Records of Operation (89-184). Ralph E. Turner. 2500 w. Pwr Pt Eng—Oct. 1, 1918. Report sheets designed to aid the engineer in obtaining highest efficiency.

Plant Design

Engineer's Life Not a Bed of Roses When Things Go Wrong (88626). S. Balmfirth. Ills. 2500 w. Pwr House—Aug., 1918. Poorly designed plant adds greatly to the labors of the engineer and is a source of danger.

Power

Conditions in the Power Industry (89-230). L. W. Schmidt. 3000 w. Power—Oct. 1, 1918. Digest of reports of U. S. Consuls on the power situation in various parts of the world, and the influence of the war.

The Year's Progress in the Power Field (83400). Ills. 8500 w. Power—Jan. 1, 1918. A general review of important developments.

Conditions in the Power Industry (86660). Ludwig W. Schmidt. 2500 w. Power—June 4, 1918. Power situation in various parts of the world.

See also Power, under INDUSTRIAL MANAGEMENT, *Management*.

Conditions in the Power Industry (82935). Ludwig W. Schmidt. 2500 w. Power—Dec. 11, 1917. Digest of reports of U. S. Consuls on the power situation in various parts of the world.

Power By-Products

The Power By-Product Problem (86133 A). T. Roland Wollaston. From a paper before the Soc. of Engrs. 1800 w. Colly Gdn—Apr. 12, 1918. Possibilities of gas-recovery system.

A Survey of the Power By-Product Problem (86390 A). T. Roland Wollaston. Abstract of paper before Soc. of Engrs. Ills. 3000 w. Ir & Cl Trds Rev—Apr. 12 1918. Estimates and possibilities.

Power Estimates

Estimating Power Requirements of a Locality (87427). Ludwig W. Schmidt.

Power Plants

2200 w. Power—July 9, 1918. Conditions necessary to form approximately correct estimate, etc.

Power House

McClary's Power House Installations at London, Ont. (87205). W. F. Sutherland. Ills. 3500 w. Pwr House—June, 1918. Details of plant for factories.

Power-Plant Operation

Improving Power-Plant Operation Through Instruction (82640 A). Herman A. Fisher. 1500 w. Ind Man—Dec., 1917. Appeal for better instruction of employees.

Power Plants

Practical Operation of a Producer-Gas Power Plant (88137 N). Francisco R. Ycasiano and Felix V. Valencia. Ills. 32 pp. Phil JI Sci—May, 1918. Describes the suction producer-gas plant in the power house of the Bureau of Science, and the trial of Philippine fuels.

The Massachusetts Plan of Power-Plant Inspection and Coal Conservation (88452). Thomas Hawley. 2500 w. Power—Aug. 27, 1918. Outlines plan of inspecting and classifying power plants.

"Gasteam" Plant at Ford City, Ontario (88061). Ills. 3500 w. Power—Aug. 6, 1918. A combination alternating and direct-current plant employing "Gasteam" engines.

Power Plant Classification (87542). A. P. Connor. 1500 w. Pwr Pt Eng—July 15, 1918. Questionnaire of the fuel administration on plant equipment and operation. How to fill it out.

Important Discussion on Varied Power Plant Subjects (84107 A). 16 pp. A S M E, JI—Feb., 1918. Papers on small turbines, waste of coal, bagasse as fuel, cooling of water, and the steam motor.

Plant Improvements Resulting in Coal Saving (84693). 2500 w. Pwr Pt Eng—March 1, 1918. Recommendations by engineer.

Prime Movers

A Comparison of the Working Costs of the Principal Prime Movers (82365 A). Oswald Wans. From a paper before the Inst. of Mech. Engrs. 1500 w. Mech Wld—Oct. 26, 1917. Serial, 1st part. Gives data for estimating capital expenditures and working costs, and establishing the relative commercial value.

Salt Plant

New Plant of the Pennsylvania Salt Manufacturing Company (88832). Ills. 4500 w. Power—Sept. 17, 1918. Interesting addition to a power plant serving a

POWER AND TRANSMISSION**Water Power**

works making caustic soda and bleaching powder by the electrolytic process.

Siberia

Power Development in Russian Asia (82149). Ludwig W. Schmidt. 2500 w. Power—Oct. 30, 1917. Possibilities of the use of machinery for the application of power in the industries of Siberia.

Sources of Energy

L'Utilisation Des Forces Naturelles (89084 B). L. De Launay. 3600 w. La Nature—Sept. 7, 1918. Utilization of natural sources of energy: wind, waves, solar radiation, terrestrial heat and gravity.

Steam Hammer

A Large Steam-Driven Drop Hammer (89336 A). Ills. 400 w. Engr—Sept. 6, 1918. Brief description.

Tanks

Displacement—Tanks (83029). Walter S. Weeks. Ills. 900 w. Min & Sci Pr—Dec. 15, 1917. Details of construction; proper form of contact-plug; general drawing of water.

Tidal Power

Tidal Power (86480). Ills. 3200 w. Times Engng Supp—Apr. 26 1918. Possible methods of utilizing the energy of ocean tides. Theoretical considerations.

Turbines

The Fifty-Thousand Kilovolt-Ampere Connors Creek Turbines (84367). C. F. Hirshfeld. 1500 w. Power—Feb. 19, 1918. Largest single-cylinder turbine.

Vibration

Prevention of Vibration in Power and Ventilating Plants (89182). Charles L. Hubbard. Ills. 3000 w. Pwr Pt Eng—Oct. 1, 1918. Causes of vibration and ways of preventing communication to building.

Waste Oil

Waste Oil Troubles (87261). W. A. Taller. Ills. 2000 w. Natl Engr—July, 1918. Causes; cleaning of oily pipes, etc.

Water Power

Comment S'Est Fait L'Aménagement Des Chutes D'Eau (89709 B). J. T. Laspierre. Ills. 6000 w. Génie Civil—Oct. 5, 1918. How French water powers are administered and utilized.

Fundamental Principles in the Development of Water Power (89517). David R. Shearer. Ills. 1500 w. Power—Oct. 15, 1918. Points to be considered, explaining the calculation of flow, theoretical horsepower, and the causes of variation of stream flow.

Engineering Council Urges Federal Water-Power Legislation (8374). 3000 w. Eng News-Rec—Jan. 24, 1918. From statement by Calvert Townley

Water Power

before the Water-Power committee of the U. S. Chamber of Commerce.

Notes on Water Supplies as Sources of Power (83374 A). Cecil H. Roberts. 2000 w. *Surv'r*—Dec. 14, 1917. Read before Instn. of Water Engrs. Wasted power; utilizing surplus water-power, etc.

Water Power in the Empire (89077). 1500 w. *Times Engng Supp*—Aug., 1918. The great need for development. Preliminary report of British Water Power Committee.

Water-Power in the British Empire (88594 A). 2500 w. *Elec Rev*—Aug. 16, 1918. Serial, 1st part. Conclusions from recently issued preliminary report of the Water-power Committee.

Water Power (88412). 2000 w. *Times Engng Supp*—July, 1918. Its de-

STEAM ENGINEERING**Boilers**

velopment in different parts of the British Empire.

Canada's Water Powers: Their Relation to the Fuel Situation (87814). J. B. Challies. Ills. 1200 w. *Pr House*—July, 1918. Shows the need of a national fuel-power policy for the development and use of the fuel resources of the Dominion.

The Government and the Water Powers (86230). An interview with Hon. Franklin K. Lane. 1800 w. *Power*—May 14, 1918. Discusses the administration's water-power bill.

Windmills

Some Long Island Windmills (89590 A). Edward P. Buffet. Ills. 2000 w. *Am Mach*—Oct. 17, 1918. Details of mechanical features of several historical windmills.

STEAM ENGINEERING**Baffles**

The Effect Upon Fuel Economy of Different Arrangements of Baffles in Boiler Tubes (88555 A). William G. Eager. Ills. 5000 w. *A S M E*, J1—Sept., 1918. Report of tests made on three Heine boilers.

Bagasse

Bagasse as a Source of Fuel (82260 A). E. C. Freeland. 2500 w. *A S M E*, J1—Nov., 1917. Calorific value of this fuel to the sugar industry. Benefits of preliminary drying.

Bagasse as a Source of Fuel (82024 A). E. C. Freeland. 8 pp. *A S M E*—Dec., 1917. The heating value of this fuel to the sugar industry, and benefits of drying.

Blower

Blower for Water-Tube Boiler Plant at Bristol Electricity Works (88720 A). Ills. & Plate. 600 w. *Engng*—Aug. 2, 1918. Detailed description.

Boiler Code

Revision of Boiler Code (82706 A). Ills. 4500 w. *A S M E*, J1—Dec., 1917. Modifications and additional revisions.

Boiler Economy

Soot and Scale (84222 A). A. A. Hutchinson. 1800 w. *Ice & Refrig*—Feb., 1918. Boiler efficiency; loss of heat due to scale, etc.

Boiler House

The Maintenance of Economy in the Boiler House (87909 A). D. Wilson. 4000 w. *Elec'n*—June 28, 1918. Importance of keeping records of performance; sampling and testing of coal, etc.

Boiler Rooms

Boiler-Room Management Plan (89007). T. N. Wynne. 2500 w. *Elec Wld*—Sept. 21, 1918. Great saving by the investment in trained men and adequate instruments.

The Air Supply to Boiler Rooms (87399 A). Richard W. Allen. Ills. 5500 w. *Engng*—June 14, 1918. Read before Instn of Nav Archts. Effect of the efficiency of the system on the speed of ships, etc.

Improving Boiler-Room Operation (87043). I. L. Kentish-Rankin. Ills. 3000 w. *Elec Rev*, Chi—June 15, 1918. Need of improved apparatus and methods, and use of indicating instruments.

Boilers

Boiler Repairs (88490). A. D. Palmer. Ills. 2200 w. *Pwr Pt Eng*—Sept. 1, 1918. Methods of patching a boiler.

Examination of Steam Boilers at Collieries (88606 A). Edward Ingham. Ills. 3000 w. *Colly Gdn*—Aug. 16, 1918. Defects to be looked for in internal and external examination.

Steam Boiler Regulation and Control (89026). Albert A. Straub. Charts & Ills. 2000 w. *Power*—Sept. 24, 1918. Importance of proper handling of the damper for controlling the draft.

Materials of Steam Boiler Construction (82775). A. J. Dixon. 2500 w. *Power*—Dec. 4, 1917. Facts concerning different grades of steel used for boiler making.

Die Stützung von Dampfkesseln und von Wasserleitungen (83314 B). E. Höhn. Ills. 2300 w. *Schweizerische Baw Zeitung*—Nov. 3, 1917. Strength of steam boilers, and water circulation.

The Form of Boiler Drums (82368). Robert Cramer. Ills. 2000 w. *Power*—Nov. 13, 1917. The most suitable shapes.

Electric Heat Storage in Boilers (82554 A). Ills. 800 w. *Engng*—Nov. 2, 1917. Detailed description of the

Boiler Tubes

Revel apparatus for generating steam by electricity.

Boiler Management with Substitute Labor (83376 A). C. E. Stromeyer. 4000 w. Colly Gdn—Dec. 14, 1917. The problem of scarcity of labor and replacement by substitutes in the working of boilers.

Boiler-Room Efficiencies (83586). George F. Weaton, with discussion. Read before Providence (R. I.) Eng. Soc. 4500 w. Power—Jan. 15, 1918. Suggested equipment for 1000-h.p. installation.

Determining Boiler Efficiency by Co₂ Analyses and Flue Temperatures (83512). Haylett O'Neill. Charts. 1800 w. Power—Jan. 8, 1918. How to obtain valuable operating data by means of simple and cheap instruments.

New Method of Increasing the Evaporation in Boilers (83401). Carl Hering. 2000 w. Power—Jan. 1, 1918. A new thermal principle in water boiling.

Possible Saving in Avoiding Leaks in Boiler Setting (84852). J. M. Aarons. 1700 w. Power—March 12, 1918. Air leakage due to cracked settings and porous bricks can be reduced by coating the brickwork.

Stoker Capacity vs. Boiler Forcing Rates (85781). Joseph T. Foster. 1500 w. Power—April 23, 1918. Ways to check boiler performance against any well-defined standard and ascertain what improvements changes will effect.

Supporting Effect of Boiler Heads (86358). Neil M. MacDonald. 1500 w. Power—May 21, 1918. Finding the allowable pressure in a boiler.

Boiler Settings (86557). Charles H. Bromley. Ills. 1600 w. Power—May 28, 1918. One of a number of articles on boiler settings for various stokers under the many different boilers adapted to high-volatile coals.

The Boiler Inspector's Work (85972). M. T. Glenn. 2500 w. Power—Apr. 30, 1918. Describes work, tools used, etc.

Boiler Settings—Multiple Retort Under Feed Stokers (87750). Charles H. Bromley. Ills. 2000 w. Power—July 23, 1918. One of several articles intended to help the burning of high-volatile, high-ash coals. Latest and best practice.

Boiler Test

Performance Test of Steam Boilers (86671). H. A. Cozzens, Jr. Ills. 5000 w. Natl Engr—June, 1918. Methods used in the average power plant.

Boiler Tubes

Some Causes of Boiler-Tube Failures (87425). R. Cedarblom. 2500 w. Power

STEAM ENGINEERING**Combustion**

—July 9, 1918. How to minimize the trouble from boilers that blister and fail.

Boiler Walls

New Data on Boiler Walls (88552). J. Crow Taylor. 1200 w. Natl Engr—Sept., 1918. Experiments indicate that an air space is not as good an insulator as a solid wall.

Clinkering

Clinkering: Its Causes and Prevention (88583). M. A. Saller. 1200 w. Power—Sept. 3, 1918. Can usually be avoided by carrying a thin fire; firing in small charges; avoiding stirring fire; and extinguishing live coals falling through the grate.

Coal

Industrial Coal for Next Winter (87740 A). 3000 w. Ind Man—Aug., 1918. What the Government is doing to assist consumers in procuring an adequate supply, and in using it with greatest economy.

Coal Handling

See same heading under **Transporting and Conveying**.

Coal Storage

Storing Coal in a Small Plant (87820). Ills. 1500 w. Elec Wld—July 27, 1918. A flexible system of portable conveyors is tied in with modern coal-handling equipment.

Coke

See same heading under **MINING AND METALLURGY, Coal and Coke**.

Combustion Control

Power Plant Management; Control of Combustion Losses (89386). Robert June. Third article of a series. 2500 w. Pr House—Sept., 1918. Economical use of fuel to minimize the inevitable coal shortage.

Combustion

Economy of Automatic Combustion Control (82907). I. L. Kentish-Rankin. 1500 w. Elec Rev, Chi—Dec. 8, 1917. Its aid in conserving the coal supply and lessening labor difficulties.

Automatic Combustion Control Saves Much Coal (83503). I. L. Kentish-Rankin. Ills. 1800 w. Elec Rev, Chi—Jan. 12, 1918. Saved 39 per cent. of coal bill in one hand-fired plant.

Smokeless Combustion of Coal (83670). Royce L. Beers. 3500 w. Pr Pt Eng—Jan. 15, 1918. Abstract of paper before the Smoke Prevention Assn. Fundamental conditions.

Efficient Combustion of Bituminous Coal With Underfeed Stokers (85847 A). Russell C. Hine. Ills. 2000 w. Ind Man—May, 1918. Improved methods of firing soft coal. Points to be looked after.

Condensers**STEAM ENGINEERING****Engine**

Unpreventable Losses in Coal Combustion Under Boilers (85501). Haylett O'Neill. 500 w. Power—April 9, 1918. Calculations showing their magnitude. Charts are given.

Combustion Characteristics of Coals and Selection of Suitable Stoker Equipment (85410 A). Joseph G. Worker. Ills. 2500 w. Elec J1—April, 1918. Available coals in United States and tests of stokers.

Low-Rate Combustion in Fuel Beds of Hand-Fired Furnaces (89635). Henry Kreisinger, C. E. Augustine and S. H. Katz. Ills. 43 pp. U S Bur Mines—Tech paper 139. Description and results of a series of tests made in an experimental hand fired furnace.

Condensation

Steam Condensation (86130 A). A. Arnold. 1800 w. Elec Rev—Apr. 12, 1918. Explanation of the process.

Condensers

Keeping Condenser Performance Up to the Mark (89609). Hartley LeH. Smith. 2500 w. Elec Ry J1—Oct. 19, 1918. How to determine the economy and how to correct causes of low vacuum.

A Flexible Condenser Installation (88488). A. H. Ganshird. Ills. 1000 w. Pwr Pt Eng—Sept. 1, 1918. Twin shell surface condenser solves problem of low headroom under cross-compound turbine unit.

Condensers and Condenser Engineering Practice (88916 N). D. D. Pendleton. 28 pp. Assn I S E E—Sept., 1918. Discusses condensers for steam prime movers. Types, their capacity and duty, etc.

Condensers (83427 B). Ills. 2000 w. Pwr Pt Eng—Jan. 1, 1918. Examples showing benefits of increased vacuum.

Condensers with Seventy-Foot Water Level Variation (83827). F. R. Brosius. Ills. 1200 w. Power—Jan. 29, 1918. Unusual type of construction to secure a supply of condensing water under unfavorable conditions.

Recent Developments in Condensers (87987). D. W. R. Morgan. Ills. 2000 w. Elec Wld—Aug. 3, 1918. Relative advantages of steam air ejectors and hydraulic and reciprocating air pumps.

Steam Condensers (87832). J. H. Coates. 4500 w. Natl Engr—Aug., 1918. The two general types and their applications.

A Fifty-Thousand Sq. Ft. Condenser (84538). Ills. 1500 w. Power—Feb 26, 1918. Condenser located at the bottom of a pit 74 ft. deep.

Modern Condenser Practice (84336 B). D. D. Pendleton, with discussion. Ills. 57 pp. Engrs Soc W Penn, Pro—Nov.,

1917. Choice of condenser, types, auxiliaries, etc.

See same heading under Measurement.

Condenser Tubes

A Short Note on a New Method of Cleaning Condenser Tubes (88255 N). T. G. Otley. 1200 w. So Af Instn Engrs, J1—June, 1918. Involves the use of discs cut out of scrap rubber.

What Is the Cure for Condenser Tube Corrosion? (88274). Hartley Le H. Smith. 3000 w. Elec Ry J1—Aug. 17, 1918. Proper selection of material and care in manufacture secure longer life of tubes.

Condensing

The Problem of Condensing in Large Power Stations (87910 A). J. H. Rider. 3500 w. Elec'n—June 28, 1918. Large quantities of condensing water necessary and methods which may be used when the flow of water on a river site is insufficient.

Cooling Systems

Cooling of Condensing Water by Towers and Spraying (88145 N). E. W. Marriott. 1800 w. Comwh Engr—July, 1918. Abstract of paper before Engng. Assn. of N. S. W. The two plants are described and the amount of cooling given. See also page 283.

Cooling of Condenser Water by Towers and Spraying (87699 A). E. W. Marriott. Ills. 1800 w. Aust Min Stan—June 13, 1918. Comparison.

Corliss, George Henry

The "One Hundredth Anniversary" of George Henry Corliss (86229). H. F. Mueller. Ills. Power—May 14, 1918. An account of the life and work of the inventor of the Corliss engine.

Efficiency

Improving the Efficiency of Boiler Plants (87133 C). G. E. Williamson. Ills. 3800 w. Paper—May 22, 1918. Read before Tech Assoc Pulp & Paper Industry, at Dayton, O., May 16, 1918.

Electric Energy

The Production of Electricity by Steam Power (84498 N). Alex Dow. 18 pp. Am El-Chem Soc, Trans—Oct., 1918. The present status of the production of electric power from steam.

Engine Design

A Comparative Study in Steam-Engine Design (86287 A). F. S. Bauer. 1200 w. Univ Col J1 Eng—April, 1918. Third installment in a discussion of the effects of design when important operating conditions are varied.

Engines

Compound Steam Engines (83321). Carroll F. Merriam. 5000 w. Natl

Engine Economy**STEAM ENGINEERING****Fuels**

Engr—Jan., 1918. Advantages and limits of compounding and factors to be considered; the steam turbine and uniflow engine.

Notes on the Uniflow Steam Engine. (83375 A). A. G. T. Poole. Read before N. of Eng. Inst. of Min. & Mech. Engrs. Ills. 4500 w. Colly Gdn—Dec. 14, 1917. Method of working applications, types and tests.

Engine Economy

Improving Engine Economy (87847). M. A. Saller. Ills. 3800 w. Pwr Pt Eng—Aug. 1, 1918. Increasing the capacity and improving the efficiency of steam engines by proper valve setting, eliminating leakage and maintaining speed regulation.

Engine Stops

Automatic Engine Stops (88914 N). Walter Greenwood. Ills. 10 pp. Assn I S E E—Sept., 1918. Mechanical principles involved, causes of failure, kinds of stops, etc.

Entropy

Entropy (86257). C. A. Joerger. Diagrams. 1500 w. Pwr Pt Eng—May 15, 1918. What it is and how to use it.

Exhaust Steam

Commercial Value of Exhaust Steam (89495). Frederick C. Ruck, with discussion. 4000 w. Natl Engr—Oct., 1918.

Using Exhaust Steam (89491). S. E. Balcome. Ills. 3000 w. Pwr Pt Eng—Oct. 15, 1918. Its value and use; adaptability, effect of engine, etc.

Exhaust Steam

Considérations Sur L'Utilisation Des Vapeurs D'Echappement (87118 B). A. Barjou. 4500 w. L'Industrie Electrique—May 10, 1918. Use of exhaust steam at coal mine plants for development of electric energy.

The Economical Employment of Auxiliary Exhaust Steam (86260 A). E. E. Wilson. Diagram. 1700 w. U S Nav Inst, Pro—April, 1918. Method of recovering waste heat, giving outline of plant.

Factory Plants

Improving Factory Steam Plants (87543). H. A. Wilcox. 5000 w. Pwr Pt Eng—July 15, 1918. Serial, 1st part. Personal experiences in attacking problems in run-down plants.

Feed Pumps

Automatic Control for Boiler Feed Pumps (82527). Ills. 1200 w. Ht & Vt Mag—Nov., 1917. Piping and method of control.

Feed Water

Using Navy Compound (88802). A. C. McHugh. 2200 w. Pwr Pt Eng—Sept. 15, 1918. Specifications for Navy com-

pound; methods of making daily tests of boiler water.

Losses and Trouble Caused by Impure Boiler Feed Water (86755 A). H. H. Mapelsden. Ills. 700 w. Gen Elec Rev—June, 1918. Special reference to the use of steam and water flow meters.

Testing the Boiler Feed Water (83998). W. A. Taller. 2500 w. Natl Engr—Feb., 1918. Methods for detecting oil, degree of hardness, acidity, or alkalinity, sulphate of lime, etc.

Reducing Costs of Fuel and Boiler Maintenance (84297). S. B. Applebaum. Ills. 3000 w. Elec Wld—Feb. 16, 1918. How costs can be reduced by softening boiler feed-water.

Testing and Treating Power Plant Feed Water (85773). Hartley LeH. Smith. 3000 w. Elec Ry JI—April 20, 1918. Careful analysis and judicious use of chemicals necessary.

Firing

How to Fire the Down-Draft Smokeless Boiler (82111). A. Bement. 3000 w. Ht & Vt Mag—Oct., 1917. Important points to consider in obtaining the required efficiency.

Fuel Economy

Fuel Economy Made Simple (89304). A. Bement. 2000 w. Power—Oct. 8, 1918. Maintain a hot fire and control the rate of combustion by adjustment of draft.

Fuel Economy in Hand-Fired Power Plants (89183). Abstract from Bul. of Ill. Engng. Experiment Station. 2000 w. Pwr Pt Eng—Oct. 1, 1918. On the preparation and storage of coal.

Some Factors in Fuel Economy in Boiler Plants (89287 A). Robert H. Kuss. (Abstract.) 2200 w. A S M E, JI—Oct., 1918. Features needing consideration to secure boiler and furnace efficiency.

Methods to Improve Plant Fuel Economy (83211 A). S. J. H. White. 2000 w. Iron Age—Dec. 27, 1917. Care of purchased power. Suggestions on boiler practice.

Fuel Saving Suggestions (82934). Charles H. Bromley. Ills. 2500 w. Power. Dec. 11, 1917. Sources of fuel loss and how waste may be minimized.

Fuels

Raising Steam with the Waste Products of Yesterday (89469). Ills. 4000 w. Cl Age—Oct. 10, 1918. Silt is today a valuable asset. Burned on a specially designed grate.

Firing Crude Oil (88262). J. W. Eshnaur. Ills. 1000 w. Pwr Pt Eng—Aug. 15, 1918. Types of burners, furnaces and methods of regulation. See p. 257.

Fuels

STEAM ENGINEERING

Furnaces

Sawdust and Wood Burning (88261). Ills. 5000 w. Pwr Pt Eng—Aug, 15, 1918. A symposium dealing with furnace designs, conditions to maintain, conveying and storage systems, etc.

The Use of Powdered Coal (87172). W. G. Wilcox. Ills. 3000 w. Min & Sci Pr—June 22, 1918. Read before Am. Chem. Soc. Possible solution of fuel shortage problem.

The Use of Pulverized Coal (86610). Ch. Dantin, in *Le Genie Civil*. 2200 w. Eng & Con—May 29, 1918. Types of furnaces and principles on which experiments were based.

Pitch as a Fuel for Power Generation (87175). John B. C. Kershaw. 3000 w. Power—June 25, 1918. Summary of the most recent patents and experiments relating to the use of coal-tar pitch as a fuel for steam boilers and internal combustion engines.

Burning Dust-Bearing Coal (86531). L. A. Stenger. 1500 w. Elec Wld—May 25, 1918. Results of tests to determine how this fuel can be burned efficiently.

Les Combustibles Inferieurs (86492 B). L. Renié. Ills. 2800 w. La Nature—Apr. 13, 1918. Furnaces and stokers for burning low-grade fuels and manufacturing wastes.

Experience With Powdered Coal (86338). A. E. MacInnes. Ills. 2000 w. Elec Wld—May 18, 1918. Method of preparing and burning. Results of tests.

The Burning of Pitch and Creosote Mixtures (86217 A). Ills. 2000 w. Engr—Apr. 19, 1918. Difficulties encountered and efforts being made to extend their successful use.

Combustion of Coal and Design of Furnaces (84878 A). Henry Kreisinger, C. E. Augustine and F. K. Ovit. Ills. 137 pp. U S Bur Mines—Bul. 135. A study of the combustion of coal in industrial furnaces.

Power from Waste and Inferior Fuels (85522 A). From address by J. Drummond Paton before Manchester Geol. & Min. Soc. Also discussion. 4000 w. Colly Gdn—March 22, 1918. Sources from which large supplies could be made available.

What Substitution of Oil for Coal Can Do (85477). Ills. 2500 w. Elec Wld—April 6, 1918. Actual experiences in New England resulting in increased economy.

Wood for Boiler Fuel (85839 A). C. T. Baker. 1500 w. Ind Man—May, 1918. In certain localities wood will produce a given amount of power at lower cost than coal.

A New Method of Burning Powdered Coal (84547 A). Ills. 2000 w. Iron Age—Feb. 28, 1918. A small diameter low-

pressure air transport system without return mains.

Symposium on Utilization of Low-Grade Fuels (82341). Ills. Also editorial. 3500 w. Elec Wld—Nov. 10, 1917. Forms of mine refuse that have been successfully burned. Problems involved.

The Use of Culm and Other Waste Fuels (82145 A). John B. C. Kershaw. 4000 w. Engr—Oct. 12, 1917. Facts based on recent practical trials in England, America and Germany.

Practical Fuel Conservation (88551). F. C. Wagner. 5000 w. Natl Engr—Sept., 1918. Suggestions for stationary engineers for conserving coal.

Power Plants and the Fuel Situation (88486). A. P. Connor. 2500 w. Pwr Pt Eng—Sept. 1, 1918. The administration's attitude toward the acquiring of coal, storage, use of exhaust, and refrigeration.

Problems Involved in Fuel Changes (88671). A. Bement. 2500 w. Power—Sept. 10, 1918. Ash and not coal is the trouble maker. Describes instances and remedies.

The Use of Lignite, Bagasse, and Wood Waste for Power Generation and Other Purposes (88620 A). John B. C. Kershaw. Ills. 3500 w. Engr—Aug. 9, 1918. Serial, 1st part. The present number deals with methods of utilizing lignite.

Wood Fuel (88554). Albert A. Cary. 1800 w. Natl Engr—Sept., 1918. Examples of successful wood-burning furnaces.

Fuel Saving

Fuel Conservation (87831). Charles W. Naylor. 2500 w. Natl Engr—Aug., 1918. Data on easily accomplished fuel saving. See also page 257.

Conservation of Fuel in California (88354). R. J. C. Wood. Map. 2500 w. Elec Wld—Aug. 24, 1918. Savings of fuel oil made by interconnection of systems.

Furnace Air

Temperatures of Furnace Air and Flue Gases (86258). W. F. Schaphorst. 1500 w. Pwr Pt Eng—May 15, 1918. Saving due to increasing temperature of air supplied and decreasing flue gas temperature.

Furnace Efficiency

Steam Boiler Furnace Efficiency (83322). S. S. Ledbetter. Ills. 3000 w. Natl Engr—Jan., 1918. Construction, operation and efficiency of powdered fuel plants.

Furnaces

Boiler Furnaces and Boiler-Furnace Design (88454). D. S. Jacobus. 4000 w. Power—Aug. 27, 1918. Address before the Am. Boiler Mfrs.' Assn., at Philadelphia, June 17, 1918.

Gas**STEAM ENGINEERING****Oil Fuel**

Adapting Furnaces to Available Coal (87285). Osborn Monnett. Ills. 1500 w. Pwr Pt Eng—July 1, 1918. Proportions and arrangements of baffles and arches in hand-fired furnaces.

Gage Glass

The Boiler Gage Glass (88977 N). William L. DeBaufre. Ills. 2200 w. Am Soc Nav Engrs, J1—Aug., 1918. Explains how to determine the actual weight of water contained in a boiler and gives the proper corrections to be applied.

Gas

Gas For Raising Steam (88414). 2000 w. Times Engng Supp—July, 1918. Recent developments in use of gas for raising steam.

Gas Firing

Gas Firing Boilers (87079 A). T. M. Hunter. From paper read before S. Wales Inst. of Engrs. 3500 w. Colly Gdn—May 31, 1918. Essentials of the economical combustion of gas.

Discussion on "Gas Firing Boilers" (86805 N). 6000 w. Instn E E, J1—May, 1918. Discussion at the Newcastle Local Section, Feb. 4, 1918.

Gas-Fired Boilers (83922). 1500 w. Times Engng Supp—Nov. 30, 1917. Abstract of paper by T. M. Hunter before Instn. Elect. Engrs. Best arrangement for different qualities of gas.

Principles and Methods of a New System of Gas-Firing (82146 A). A. C. Ionides. Ills. 1500 w. Engr—Oct. 12, 1917. Read before the Inst. of Metals. Explains methods and their advantages.

Gas Firing Boilers (82895 N). T. M. Hunter. 15500 w. Instn E E—Oct., 1917. Study of the subject.

Gas-Firing Boilers (82836 A). T. M. Hunter. 3000 w. Elec'n—Nov. 23, 1917. Serial, 1st part. Abstract of paper before Instn. of Elec. Engrs. Drying and cleaning gas, heat transfer, types of boilers, etc.

Discussion on "Gas Firing Boilers" (84824 N). 5000 w. Instn E E, J1—Feb., 1918. Discussions at Birmingham and Scottish Local sections, of T. M. Hunter's paper.

Gaskets

Gaskets for Steam-Pipe Lines (87277). Zeno Schultes. Ills. 1800 w. Power—July 2, 1918. Facts regarding packing for steam lines, etc. Reasons why flanged pipe joints leak.

Figuring Furnace-Grate Area (86556). Ills. 2500 w. Power—May 28, 1918. Rules followed by a number of manufacturers.

Heat Generation

Generation of Heat from Bituminous Coal and Its Absorption by the Steam Boiler (89496). Henry Misostow, with discussion. Ills. 4500 w. Natl' Engr—Oct., 1918. Actual and apparent efficiencies.

High Vacuum

First Report of the Council of the North East Coast Institution of Engineers and Shipbuilders on Certain Methods of Producing High Vacuum (84942 N). Edwin L. Orde, C. Waldie Cairns, and J. Morrow. 50 pp. N-E C Instn, Trans—Feb., 1918.

Induced Draft

European Practice in the Design of Induced Draft Plants (88625). Frank C. Perkins. Ills. 4000 w. Pwr House—Aug., 1918. Advantages over natural draft. The various systems, etc.

Isolated Plants

Isolated Plant for Chemical Factory (85610). Ills. 1500 w. Pwr Pt Eng—April 15, 1918. Steel encased boilers, underfeed stokers and four-valve engines make for efficiency.

Insulation of Steam Pipes

See Coal Waste, page 223. Radiation, page 267.

Leaks

Capitalization Value of Steam Leaks (86092). R. von Fabrice. Chart. 1000 w. Power—May 7, 1918. Capitalization value from saving a pound of steam per hour.

Low Vacuum

Diagnosing and Correcting the Causes of Low Vacuum (88993). Hartley Le H. Smith. 5000 w. Elec Ry J1—Sept. 21, 1918. Maintenance of surface condensers.

Oil Fuel

Efficiency in the Use of Oil Fuel (89,586). J. M. Wadsworth. Ills. 75 pp. U S Bur Mines—Aug., 1918. A handbook for boiler-plant and locomotive engineers. Aims to eliminate waste.

Economical Method of Burning Fuel Oil (86690 A). Ills. 2500 w. Int Mar Eng—June, 1918. Fifty per cent. increase in economy claimed for Sklovsky, or "Oilgas" furnace developed by General Combustion Co.

Oil Fuel in New England Power Plants (86684 A). Henry W. Ballou. (Abstract.) Ills. 2500 w. A S M E, J1—June, 1918. Brief statement of the present status. Rapid increase.

Practical Details in Burning Fuel Oil Under Boilers (82637 A). Henry James Kennedy. Ills. 3500 w. Ind Man—Dec., 1917. Reviews methods of employing oil as fuel for steam generation. See also pp. 192, 272.

STEAM ENGINEERING

Soot Removal

Pipe Explosions

Steam Pipe Explosions (87760 A). Edward Ingham. Ills. 1800 w. Colly Gdn—June 28, 1918. Principal factors responsible. Design and arrangement.

Piping

Piping for Steam-Generating Plants (85611). 2500 w. Pwr Pt Eng—April 15, 1918. Installation and operation from safety viewpoint.

Pitch

Pitch As A Fuel (86479). 2000 w. Times Engng Supp—Apr. 26, 1918. Its use for firing steam boilers.

Powdered Coal

Control of Combustible and Air in Burning Powdered Coal (88185). W. G. Wilcox. From paper before Am. Chem. Soc. 2000 w. Com Air Mag—Aug., 1918. Its value as a fuel and the conditions for success.

Powdered Fuel for Steam Raising (85203). 2000 w. Times Engng—Supp—Feb. 22, 1918. Serial, 1st part. Principles, history, what fuels to use, drying, etc.

Powdered Fuel

Use of Powdered Fuel for Metallurgical Furnaces and for Steam Raising (87408 A). 2000 w. Ir & Cl Tdrs Rev—May 24, 1918. Brief account.

Powdered Fuel for Steam Raising (85879). 2000 w. Times Engng Supp—March 29, 1918. Drying and storing system, burners, furnace details, etc.

The Use of Coal in Pulverized Form (85807 D). H. R. Collins. 2500 w. A I M E, Bul—April, 1918. The preparation of the coal, the advantages of its use; essentials of feeder and burner; design of furnace, etc.

Power

Development of Power from the Standpoint of the Boiler Room (88299). C. F. Hirshfeld. 2500 w. Power—Aug. 20, 1918. J. E. Aldred Lectures on Engineering Practice at Johns Hopkins University. (Abstract.) Suggestions.

Power Cost

See same heading under **INDUSTRIAL MANAGEMENT, Finance and Costs.**

Power Plants

Remodeling the St. Louis Baden Station (86921). K. Toensfeldt. Ills. 1700 w. Power—June 18, 1918. Will contain four boilers from old station and four new boilers of same size. Reconstruction without interruption of service.

Economies in Power-Plant Operation (82906). F. N. Lawton. Ills. 2000 w. Elec Rev, Chi—Dec. 8, 1917. Suggestions for increasing boiler and engine-room efficiency.

Pressure Losses

Pressure Losses in Steam Plants

(88801). R. S. Hawley. 2000 w. Pwr Pt Eng—Sept. 15, 1918. Causes; distinction between losses due to throttling and radiation.

Scale

Boiler-Tube Scale; Its Removal with Kerosene as Practiced at the Fuel-Oil Testing Plant (88974 N). Albert M. Penn. Ills. 1500 w. Am Soc Nav Engrs, Jl—Aug., 1918. Successful method.

Smoke

Controlling Smoking Chimneys (82689). Ills. 1200 w. Power—Nov. 27, 1917. Efforts of a large power plant to assist in the prevention of smoke.

Smoke Abatement Activities in American Cities (82112). Joseph M. Lonergan, J. W. Henderson and Walter M. Squires. Ills. 3000 w. Ht & Vt Mag—Oct., 1917. Work in New York, Pittsburgh, and Cincinnati.

Smoke—Its Cause, Effect and Remedy (82537 B). Joseph M. Lonergan. Ills. 22 pp. Mun Engrs' Jl—Oct., 1917. States the principal causes, and effects, and the most successful remedies.

Soot

Avoiding a Preventable Loss (86787). 3500 w. Elec Wld—June 8, 1918. Loss from soot formation, and methods of removing soot.

Soot and Soot Blowers (86795). 3500 w. Power—June 11, 1918. Nature of soot and its effect on heat transfer through boiler-heating surfaces. Mechanically operated soot blower versus hand cleaning.

Soot, Its Effects, and Removal (86005). Charles L. Hubbard. Ills. 2500 w. Natl Engr—May, 1918. Nature of soot and its insulating effects; removal and types of soot blowers.

Soot Removal from Boiler Surfaces (82340). Lionel Linnell. 1500 w. Elec Rev, Chi—Nov. 10, 1917. Evils of soot and a comparison of hand and mechanical methods for its removal.

Soot Blowers

Soot Blowers for Vertical and Hollow Stay-Bolt Boilers (88118). Ills. 2500 w. Power—Aug. 13, 1918. Details of various systems. Special makes of blower and a system designed for continuous soot removal.

Soot Blowers for Horizontal Water-Tube Boilers (87276). Ills. 3000 w. Power—July 2, 1918. Various types on the market and their application to the different boilers in use.

Soot Removal

Soot Removal From Fire-Tube Boilers (88453). Ills. 1500 w. Power—Aug. 27, 1918. Describes rear-end and front-end blowers and other cleaners.

STEAM ENGINEERING

Turbines

Starting Torque

Methods of Finding Starting Torque (87866). L. L. Loomer. 700 w. Power—July 30, 1918. Test made on a cross-compound horizontal engine in a rolling-mill.

Steam

Economy in Steam Generation (85204). 1800 w. Times Engng Supp—Feb. 22, 1918. Tests on stack and uptake gases, soot filters, automatic recorders, etc.

Steam Economies

Possible Economies by the Use of High-Pressure Steam (87908 A). Frederick Samuelson. Ills. 2800 w. Elec'n—June 28, 1918. Considers improved efficiency obtainable by increasing the temperature and pressure of steam. Particulars of Rugby works of the British Thomson-Houston Co., Ltd.

Steam Flow

Effect of Feed-Water Temperature and Rate of Injection Upon Steam Flow (87178). Frank G. Philo. 600 w. Power—June 25, 1918. Chart showing effect, with explanation.

Steam Mains

Underground Steam Mains (85368). Charles L. Hubbard. Ills. 2200 w. Power—April 2, 1918. Serial. 1st part. Need of care in construction as they are less accessible.

Steam Plant

Cedar Rapids Big Steam Plant (89-229). Ills. 4000 w. Power—Oct. 1, 1918. Plant of the Iowa Ry. & Light Co. Services cover a territory about 200 miles long and 75 miles wide.

Steam Practice

Investigation of the Uses of Steam in the Canning Factory (86189 A). Julian C. Smallwood. Ills. 5500 w. (Abstract.) A S M E, JI—May, 1918. Principles and best practice in the use of steam.

Value of Higher Steam Pressures (86205). J. T. Foster. 800 w. Elec Wld—May 11, 1918. Statement of yearly saving which can be realized from higher steam pressures.

Steam Pressures

Advisability of Higher Steam Pressures (82876). J. T. Foster. 1000 w. Elec Wld—Dec. 8, 1917. Curves showing improvement in water rates and thermal efficiencies. Estimate of cost.

Steam Turbines

Steam Turbine Development and Tendencies (86630). Ills. 2200 w. Elec Rev, Chi—Oct. 19, 1918. Gradual refinements affecting economy, reliability, safety and increased capacity taking place.

Additional Power by Using Low-Pressure Turbine (89306). Ills. 1200 w. Power—Oct. 8, 1918. Electric power is

not always available, and the installation of a turbine with speed-reducing gears is a solution of the problem.

Advantages of Superheated Steam and Its Effect on Turbine Efficiency (86207 A). Eskil Berg. 1500 w. Am Soc Mar Dftn, JI—Jan., 1918. Explains reasons for its great economical value.

Stokers

Design and Construction of Mechanical Chain-grate Stokers (88995 A). W. H. Grantham. Ills. 1800 w. Mech Wld—Aug. 30, 1918. Serial, 1st part. Types and their operation.

The Stoker of the Future (89002). Joseph Harrington. 1500 w. Elec Rev, Chi—Sept. 21, 1918. Analysis of mechanical stoker evolution as influenced by coal characteristics, clinker, efficiency and rate of combustion.

Superheaters

Superheater Operation (85256 A). From *The Locomotive*. 1500 w. Mech Wld—March 8, 1918. Types and their efficiency and management.

Superheater Unit Maintenance (89209). 1200 w. Ry Rev—Sept. 28, 1918. Instructions for installation and care.

Superheaters—Their Advantages, Installation and Operation (82255). W. A. Taller. Ills. 1700 w. Natl Engr—Nov., 1917. Flooding superheaters, cleaning and care.

Superheated Steam

Superheated Steam Accessories (89071). 2000 w. Times Engng Supp—Aug., 1918. Piping, valves, joints, best materials to use, etc.

Advantages of High Pressure and Superheat as Affecting Steam-Plant Efficiency (88556 A). Eskil Berg, with short discussion. 2500 w. A S M E, JI—Sept., 1918. Discusses possible improvements, showing that best results come from combined use of high pressure and superheat.

Tars

The Tars Distilled from Bituminous Coal in Hand-Fired Furnaces (88871). S. H. Katz. Ills. 13 pp. U S Bur Mines—Tech paper 195. Results of tests dealing especially with the liquid, or tar part, at ordinary temperatures, of the volatile matter evolved in a coal fire.

Turbine Bearings

Some Notes on Turbine Bearings and Their Lubrication (86359). Charles H. Bromley. 2000 w. Power—May 21, 1918. Data gathered from many sources.

Turbines

A 35,000 Kw. Turbine is Wrecked in Northwest Station, Chicago (88585). Ills. 2000 w. Power—Sept. 3, 1918. Detailed description. Failure of the 19-inch wheel the probable cause.

Turbines

A New Theory of the Steam Turbine (87894 A). Harold Medway Martin. 3500 w. Engng—July 5, 1918. Serial, 1st part. Reasons for believing another great anomaly in steam-turbine engineering may be traced to an error in the theory of the efflux of steam.

Small Steam Turbines (87976 A). J. Humphrey. Ills. 1600 w. Ir & Cl Trds Rev—July 19, 1918. Their increased use, care, etc.

The Forty-Five-Thousand Kilowatt Compound Turbine at Providence, R. I. (88451). J. P. Rigsby. Ills. 2200 w. Power—Aug. 27, 1918. Detailed description of turbine recently started.

Interpreting Steam-Turbine Test Curves (86922). H. E. Brelsford. 1100 w. Power—June 18, 1918. Standard turbine data curves and how they are derived and used.

Milestones in Small Turbine Development (86750 A). Ivan Stewart Forde. Ills. 2500 w. Elec JI—June, 1918. Their rapid increase in popularity, the requirements, applications, etc.

The New Commonwealth Edison Turbine (86747 A). J. F. Johnson. Ills. 5000 w. Elec JI—June, 1918. Details of unit recently installed in the Northwest station, Chicago.

Getting a High Vacuum at the Turbine Exhaust (87658). Hartley Le H. Smith. 2500 w. Elec Ry JI—July 20, 1918. Shows how the faults in condenser design are being overcome and that the place for high vacuum is in the exhaust nozzle of each turbine.

Sur Les Turbines A Vapeur (82656 B). A. Normier. 3500 w. Industrie Electrique—Oct. 25, 1917. Calculation of turbine efficiencies under various conditions.

A Commercial Analysis of the Small-Turbine Situation (82702 A). W. J. A. London. Ills. 6000 w. A S M E, JI—Dec., 1917. Analysis of the four types of small steam turbines, dealing principally with non-condensing units.

Turbine Nozzles (83397 B). Ills. 2000 w. Pwr Pt Eng—Jan. 1, 1918. Determination of proper sizes and shapes. Materials used.

Turbine Piping (83396 B). Ills. 1200 w. Pwr Pt Eng—Jan. 1, 1918. Piping layouts for various turbine systems.

Arrangement of Turbines (83395 B). Ills. 2500 w. Pwr Pt Eng—Jan. 1, 1918. Reasons for vertical, horizontal, single and double flow, bleeder, mixed pressure, exhaust and reversing turbines.

Turbines—Types, Operative, Installations and Care (83428 B). Ills. 28 pp. Pwr Pt Eng—Jan. 1, 1918. Details of many types.

STEAM ENGINEERING**Uniflow Engines**

Blade Rings (83399 B). Ills. 2000 w. Pr Pt Eng—Jan. 1, 1918. Types and arrangements.

Governing of Turbines (83425 B). Ills. 1200 w. Pwr Pt Eng—Jan. 1, 1918. Classification of methods.

Steam Turbines (83394 B). Ills. 3000 w. Pwr Pt Eng—Jan. 1, 1918. Types and classification, characteristics, etc.

Turbine Blading (83398 B). Diagrams. 3000 w. Pwr Pt Eng—Jan. 1, 1918. Shape and dimensions for blading of reaction types.

Turbine Economy (83426 B). Chart and curves. 1500 w. Pwr Pt Eng—Jan. 1, 1918. Effects of variation in steam pressure, superheat, vacuum and size.

A Mixed Pressure Steam Turbine (84690). Ills. 1800 w. Pwr Pt Eng—March 1, 1918. A 2000 kw. turbine, running at 3000 r.p.m.

Tosi Marine Steam Turbines (84740 A). Ills. 800 w. Int Mar Eng—March, 1918. Types of turbines built in Italy for naval and merchant vessels.

Wreck of a Thirty-five Thousand Kilowatt Turbine (85009). Ills. 3500 w. Power—March 19, 1918. Account of the wreck of a horizontal single-cylinder impulse steam turbine in the O street station of the Boston Elevated Ry. Co., Feb. 14, 1918.

Low-Pressure Turbines for Lineshaft Drive (85662). R. J. Horne. Ills. 1500 w. Power—April 16, 1918. 600 hp. obtained in a paper mill without any cost for steam.

Some Safety Devices for Steam Turbines (84147 A). Ills. and Plate. 3500 w. Engr—Jan. 18, 1918. Devices of the Oerlikon Co. of Switzerland. Their construction and working.

The Historical Development of the Steam Turbine (84264 A). Francis Hodgkinson. 3500 w. A E R A—Jan., 1918. Built as far back as 1833.

Turbo-Blowers

Turbo-Blowers and Turbo-Compressors (82302 N). V. Oswald Davis. Ills. 2500 w. Beama JI—Oct., 1917. Their advantages, efficiency, etc.

Uniflow

Valve Gear of Uniflow Engines (82117). Ills. 2000 w. Pr Pt Eng—Nov. 1, 1917. Methods employed to operate valves for condensing and non-condensing types.

Uniflow Engines

Notes on the Uniflow Steam-Engine (84940 N). G. G. T. Poole, with discussion. Ills. 8000 w. Instn Min Engrs, Trans—Jan., 1918. Conditions to be con-

Vertical Engines TRANSPORTING AND CONVEYING Coal Handling

sidered before installing a uniflow engine, methods of working, and advantages over other types.

Vertical Engines.

Bijdrage tot de Constructie Van Zuinige Verticale Stoomwerktuigen (89711 B). G. Brouwer. Ills. 4600 w. Ingenieur—Aug. 3, 1918. Serial, 1st part. Description.

Waste Gases

Use of Waste Gases for Steam Generation (89124). J. B. C. Kershaw. 3500 w. Cl Age—Sept. 26, 1918. Economics, etc.

Waste Heat

The Utilization of Waste Heat from Open-Hearth Furnaces for the Generation of Steam (89549 N). Thomas B. Mackenzie. Ills. 24 pp. Ir & St Inst—Sept., 1918. Tests described and results in practice given.

The Utilization of Waste Heat from Open-Hearth Furnaces for the Generation

of Steam (89202 A). Thomas B. Mackenzie. Ills. 6500 w. Ir & Cl Trds Rev—Sept. 13, 1918. Details of installations.

Water Softener

International Water Softener (87868). Ills. 1200 w. Power—July 30, 1918. Detailed description of apparatus.

Water Cooling

The Cooling of Water for Power-Plant-Purposes (82701 A). C. C. Thomas. Ills. 2000 w. A S M E, J1—Dec., 1917. Work to ascertain conditions governing the cooling of water by means of spray ponds.

See also *Heating and Cooling*.

Water-Tubes

Renewing Tubes, Headers and Baffles in Water-Tube Boilers (89663). Ills. 5000 w. Power—Oct. 22, 1918. Detailed directions for the work.

TRANSPORTING AND CONVEYING**Ash Handling**

Economic Handling of Ashes (87091 A). Reginald Trautschold. Ills. 3000 w. Ind Man—July, 1918. Latest developments in mechanical ash handling equipment with approximate costs.

The Automatic Disposal of Ashes from Power Houses by Means of Ropeways (83369 N). J. Wallwyn White. Ills. 3000 w. Elec'n—Dec. 14, 1917. (Special No.) Ropeway installations are described.

Cableways

Les Transporteurs Aériens Dans La Guerre De Montagne (87734 B). M. Bousquet. Ills. 2600 w. La Nature—June 8, 1918. Telfers, or aerial transporters of supplies and ammunition in the mountains of the Austro-Italian front.

Cargo Crane

The Modern Cargo Crane (83362 N). Claude M. Toplis. Ills. 5500 w. Elec'n—Dec. 14, 1917. (Special No.) Relative advantages of the electric, steam and hydraulic types.

Charging Machines

Charging Machines (83365 N). Fred G. Smith. Ills. 1500 w. Elec'n—Dec. 14, 1917. Saving in labor.

Coal Handling

Handling Roundhouse Coal (88670). Ills. 1800 w. Power—Sept. 10, 1918. A modern coal-handling system of belt conveyors.

Modern Steam Turbines (88623 A). J. Humphrey. Ills. 2700 w. Ir & Cl Trds Rev—Aug. 9, 1918. Describes a new blading system which removes all chance of

trouble from fine radial clearances. Also principal types at present in operation.

Problems of Coal Handling (87907 A). W. B. Woodhouse. 4500 w. Elec'n—June 28, 1918. Data in regard to the quantities necessary for a station with a load of 100,000 kw. and the ground required for sidings. Types of plant available for handling.

Transferring Coal from Railroad to Vessel (83545 A). Ills. 2000 w. Ry & Loc Eng—Jan., 1918. Recent developments in mechanical handling.

Conveyors and Elevators (83367 N). W. H. Atherton. Ills. 2500 w. Elec'n—Dec. 14, 1917. Serial. 1st part. (Special No.) Types for coal and ash.

Coal-Handling Plant at the Saltley Gas-Works (86709 A). George Frederick Zimmer. Ills. & Plate. 3500 w. Engng—May 17, 1918. Detailed description.

Labor-Saving Coal Handling for the Factory Power House (86560 A). Reginald Trautschold. Ills. 6500 w. Ind Man—June, 1918. Conveying machinery used in modern power houses. Compares costs of various types.

Coal Handling Plant at Oran, Algeria (85303 A). Ills. 2000 w. Engr—March 8, 1918. Modern, up-to-date coaling machinery.

Handling Coal and Ashes in the Boiler House (85623). Henry J. Edsall. Ills. 2500 w. Cl Age—April 13, 1918. A system believed to be a model installation.

Railway Truck Tipplers (85262 A). Ills. 1500 w. Colly Gdn—March 8, 1918. Plan and description of coal-handling plant at Acton Lane.

TRANSPORTING AND CONVEYING Handling Devices

Conveyors

Selection of Coal and Ash Conveyors (83585). H. E. Birch. Ills. 3500 w. Pwr—Jan. 15, 1918. Operation, maintenance, investment and adaptability.

Conveying Plant

Layout of a Modern Conveying Plant (86178). Ills. 2500 w. Auto Ind—May 9, 1918. Three systems installed in factory at Wayne, Mich., showing latest practice in gravity, overhead, and chain methods.

Conveyors

The New Gravity Bucket Conveyor of Messrs. Fraser and Chalmers, Erith (87762 A). G. F. Zimmer. Ills. 800 w. Engng—June 28, 1918. Detailed description.

Conveyors for Chemical Works (88183 B). William H. Atherton. Ills. 1700 w. Cas Eng Mthly—July, 1918. Serial, 1st part. Present article deals with devices in use in gas and chemical works.

The Human Conveyor (88184 B). George Frederick Zimmer. Ills. 1200 w. Cas Eng Mthly—July, 1918. Performance of man as a motor when hauling a load, based on experiments conducted by Prof. Max Ringelmann.

Discussion of Mr. Harold C. Jenkins' Paper on "Underground Conveyors" (87084 N). 7 pp. Instn Min Engrs, Trans—May, 1918.

Conveyor at the Wellpark Brewery, Glasgow (88845 A). G. F. Zimmer. Ills. 1500 w. Engng—Aug. 16, 1918. A new departure combining the push-bar or drag-link conveyor and the roller runway.

Conveying

Driving Power Required by Conveyors of Various Types (88891 B). R. F. Muirhead. 2500 w. Cas Eng Mthly—Aug., 1918. Power required to transport material between given terminals and power consumption.

The Early History of Conveying by Mechanical Means (88892 B). G. F. Zimmer. Ills. 3000 w. Cas Eng Mthly—Aug., 1918. Serial, 1st part. Historical aspect of continuous handling devices for bulk material of various kinds.

Cranes

See same heading under **INDUSTRIAL MANAGEMENT, Welfare and Safety.**

Build Huge Crane for Shipyard Use (86586 A). Ills. 2000 w. Mar Rev—June, 1918. Will have lifting capacity of 392 net tons.

Giant Crane for the United States Navy (83666). W. H. Shepard. Ills. 1000 w. Am Mach—Jan. 17, 1918. Details, showing size and capacity.

Examples of Electrically-Driven Cranes (83359 N). H. H. Broughton.

Ills. 3500 w. Elec'n—Dec. 14, 1917. (Special No.) Importance of using machinery in place of unskilled labor.

Giant Crane for United States Navy (82238 A). Ills. 1000 w. Int Mar Eng—Nov., 1917. 200-ton floating crane for Norfolk navy yard.

Crane Motors

Bridge Motors for Overhead Traveling Cranes (88915 N). R. H. McLain. 9 pp. Assn I S E E—Sept., 1918. Rules for selecting the proper size of motor and gear ratio for bridge motion.

Electric Equipment

Notes on the Electric Equipment of Machinery for the Handling of Materials (83360 N). Ills. 2500 w. Elec'n—Dec. 14, 1917. Serial, 1st part. (Special No.) Details of electrical equipment.

Electric Trucks

Electric Industrial Trucks Help Reduce Present Serious Labor Shortage (83392 A). Ills. 1200 w. Com Vhle—Jan. 1, 1918. Their use in munition plants and factories.

Elevators

Operation and Maintenance of Elevators—Winding-Drum Machines (83510). R. H. Whitehead. Ills. 2200 w. Power—Jan. 8, 1918. Details of a modern winding-drum type elevator machine.

Freight Handling

Handling Freight on New York's New Steamship Pier (82859). C. W. Staniford. Ills. 1800 w. Eng News-Rec—Dec. 6, 1917. Latest ideas in equipment details.

How Freight-Handling Machinery Is Being Used Abroad (85562). Harry Varn-dell. Ills. 1200 w. Eng News-Rec—April 11, 1918. For trans-shipment at ports, and for warehouse movements.

Grain Handling

Grain Handling Plant (89537 A). Ills. 1500 w. Engr—Sept. 20, 1918. A recent installation of large capacity at Manchester, England, is described in detail.

Handling

Meeting Increasing Industrial Demands (86650). Ills. 3300 w. Pwr Pt Eng—June 1, 1918. Monorail coal and ash handling equipment and unique electric distribution system.

Typical Mechanical Handling of Miscellaneous Articles (86561 A). A. B. Proal, Jr. Ills. 1500 w. Ind Man—June, 1918. Gives typical installations for handling classified material. No conveyor is capable of handling all kinds of goods.

Handling Devices

British Shell-Shop Handling Devices (85838 A). George Frederick Zimmer. Ills. 3500 w. Ind Man—May, 1918. Se-

Consult Classification of the Index. See page 9.

Handling Materials

rial. 2d part. Deals with jib and portable cranes, travelling jib cranes, telfers, transporters and shell-holding appliances.

British Shell-Shop Handling Devices (85278 A). George Frederick Zimmer. Ills. 4000 w. Ind Man—April, 1918. Types of runways, conveyors, elevators, and trucks for lifting and transporting shells.

Handling Materials

Belt Shipping Plants (83355 N). F. G. Mitchell. Ills. 1300 w. Advantages of the belt-conveyor for the shipment of coal and ore. Plant at Durban.

Economic Transport and Its Influence on the Price of Everything (83358 N). Alfred Warwick Gattie. 2500 w. Elec'n—Dec. 14, 1917. (Special No.) Illustrates the importance of the cost of transport.

The Equipment of Railway Goods Stations with Electrical Machinery for Dealing with General Merchandise (83356 N). Roger T. Smith. Ills. 8000 w. Elec'n—Dec. 14, 1918. (Special No.) Considers electricity superior to any other motive power. Examples given.

The Present-Day Handling of Our Foodstuffs by Machinery (83357 N). Ills. 4500 w. Elec'n—Dec. 14, 1917. (Special No.) Examples of the conveyor applied to handling important foodstuffs.

Handling Bulk Material by Man and Machine Power—A Comparison (84567 A). George Frederick Zimmer. Ills. 2500 w. Ind Man—March, 1918. Based on British practice. Comparative costs.

Hoist

A 35-Ton Wagon Hoist for Steel Works (86360 A). Ills. 1400 w. Elec Rev—Apr. 19, 1918. An installation of electrically-driven hoisting machinery recently put in service in England.

Haulage

Heavy Construction Hauling Practice Modified by War Conditions (88483 A). George H. Pride. 2000 w. Eng News-Rec—Aug. 29, 1918. Practice developed in the construction of cantonments.

Locomotive Cranes

Locomotive Crane Sprang from Small Beginnings (82857). James Shearer. Ills. 2500 w. Eng News-Rec—Dec. 6, 1917. Development and uses, types of power, etc.

MISCELLANY

Material Handling

Efficiency in the Handling of Railway Supplies (88640). Charles E. Parks. Ills. 3500 w. Ry Age—Sept. 6, 1918. Serial, 1st part. Methods employed by the Santa Fe in storing and handling material.

Material Handling

How to Move Materials by Machinery (87097 A). Henry J. Edsall. Ills. 4000 w. Ind Man—July, 1918. Applications of various types of elevating and conveying machinery to load, unload and transport materials.

Ore Loading

Installation Pour L'Embarquement (85890 B). Ills. 1000 w. Le Génie Civil—March 30, 1918. A loading conveyor for iron ore installed at Bilbao, Spain.

Iron Ore Loading Plant at Bilbao (83756 A). George Frederick Zimmer. Ills. 900 w. Engng—Dec. 28, 1917. Describes the unusual features of the plant.

Ropeways

Ropeways in War-Time (88388 A). Ills. 1500 w. Mech Wld—June 21, 1918. New and revised forms of ropeways introduced to meet the need.

The Ropeway in Modern Warfare (87570 A). George Frederick Zimmer. Ills. 13 pp. Cas Eng Mthly—June, 1918. The importance of the ropeway in the war.

Shoveling Machine

Successful Shoveling Machine (85621). Ills. 1500 w. Cl Age—April 13, 1918. Its use for coal loading. Details of design and construction.

Telfers

Telfers and Transporters (83368 N). George Frederick Zimmer. Ills. 6000 w. Elec'n—Dec. 14, 1917. (Special No.) Compares merits of telfers and conveyors; describes types of telfers in use and performance that may be expected.

Unloaders

L'Installation Pour Le Chargement Du Charbon (82664 B). Ills. 2600 w. Génie Civil—Oct. 20, 1917. Coal conveyors and unloaders on wharf at Durban, South Africa.

Unloading

Portable Pneumatic Grain Unloading Plant (88614 A). Ills. 1200 w. Engr—Aug. 2, 1918. Details of a plant recently tested at Ipswich.

MISCELLANY

Discussions

Discussions of Papers on Varied Subjects (84108 A). 8 pp. A S M E, JI—Feb., 1918. Heat transfer, surface resistance, air purification, balancing, etc.

Further Discussions of Varied Papers (84109 A). 2500 w. A S M E, JI—Feb., 1918. Papers by F. W. Dean, L. C. Loewenstein, H. L. Gantt, C. J. Ramsburg, and C. H. Bedell.

MISCELLANY

War Work

Dye Industries

The Physical Basis of Color-Technology (82760 A). M. Luckiesh. 6000 w. *Met & Chem Eng*—Dec. 1, 1917. Résumé of a series of investigations carried out at the Nela Research Laboratory.

Filter-Press

The Filter-Press (84074 A). D. R. Sperry. Ills. 2500 w. *Met & Chem Eng*—Feb. 1, 1918. Construction and functions.

Filtration

Plate-and-Frame Filtration (84724 A). D. R. Sperry. Ills. 1000 w. *Met & Chem Eng*—March 1, 1918. Details of filter-presses and the principles of operation of press named

Gas Attacks

American Chemists' Defensive Measures Against Gas Attacks in France (86899 A). Robert K. Tomlin, Jr. Ills. 2200 w. *Met & Chem Eng*—June 15, 1918. Method devised for meeting attacks of poison gas.

Glycerine

La Fabrication De La Glycérine (83903 B). A. Breton. Ills. 1900 w. *La Nature*—Nov. 24, 1917. Popular description of methods and apparatus commonly employed for manufacture of glycerine.

Helmets

Ancient Helmet Making (88937 A). H. H. Manchester. Ills. 2500 w. *Am Mach*—Sept. 19, 1918. Describes helmets used from 2920 B.C. to the present time.

Leavitt, E. D.

An Account of the Engineering Work of E. D. Leavitt (82925 A). F. W. Dean. Ills. 45 pp. *A S M E*—Dec., 1917. A review.

Mirrors

The Deposition of Silver Films on Glass (82189 B). Alexander Silverman and Raymond M. Howe. 4000 w. *Jl Ind & Eng Chem*—Nov., 1917. Investigation aiming to produce the best mirrors possible.

Photography

Color and Color Photography (82165 B). C. D. Hodgman, with discussion. 9 pp. *Cleve Eng Soc, Jl*—Sept., 1917. Present methods and problems involved.

Technical Photography and Its Use in Industrial and Commercial Organizations (82193 B). John H. Graff. 3000 w. *Jl Ind & Eng Chem*—Nov., 1917. How photography can be used technically for better efficiency and to good advantage.

The Physical Characteristics of the Elementary Grains of a Photographic Plate (82458 B). Millard B. Hodgson. Ills. 10 pp. *Fkn Inst, Jl*—Nov., 1917. Data obtained in a study.

Shoveling Machine

Successful Shoveling Machine (85621). Ills. 1500 w. *Cl Age*—April 13, 1918. Its use for coal loading.

Warfare

Methods of Gas Warfare (85392 B). S. J. M. Auld. 5000 w. *Jl Ind & Eng Chem*—April, 1918. Methods of attack, etc.

War Resources

Building the American War Machine (83433 D). Charles M. Pepper. Photographs. 6000 w. *Iron Age*—Jan. 3, 1918. (Special No.) How industrial leaders have marshaled their resources.

War Work

Mechanical Engineers Discuss War Work (82986 A). 6000 w. *Iron Age*—Dec. 13, 1917. Topics discussed at the annual meeting of A. S. M. E.

MINING AND METALLURGY

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BASE METALLURGY

Copper

Analysis

New Method of Determining Copper (86555). James Moir. 1200 w. Min & Sci Pr—May 25, 1918. Method for correct analysis dispensing with the large quantities of potassium iodide heretofore used.

Arizona

The Story of the U. V. X. Bonanza (83487). T. A. Rickard. Ills. & Maps. 5000 w. Min & Sci Pr—Jan. 5, 1918. Serial, 1st part. History of a long and discouraging development of copper mines splendidly vindicated.

Arkansas

The North Arkansas Zinc and Lead Field (84304). Tom Shiras. Ills. 1600 w. Eng & Min JI—Feb. 16, 1918. Recent progress in metallurgical processes and developments in the sulphide zone.

Bag Houses

An Automatic Filter at Depue (82502 D). G. S. Brooks and L. G. Duncan. Ills. 1000 w. A I M E, Bul—Nov., 1917. Describes gas-filtering apparatus for removal of dust from crushing and milling plants.

Benzol

Benzol Rectification (86702 A). T. D. Hamer. 4000 w. Colly Gdn—May 3, 1918. Latest developments in the continuous debenzolizing apparatus, giving actual results selected for periods of one month.

British Coal

Britain's Coal Trade Since 1914 (86846). M. K. Moorehead. 2500 w. Naut Gaz—June 15, 1918. Reports decline in production and loss of foreign markets among other effects of the world war.

By-Products

By-Product Coke Industry in War Time (86844 A). William Hutton Blauvelt. Read before Am. Ir. & St. Inst. 1500 w. Iron Age—June 13, 1918. Importance of fuel conservation; raw materials for high explosives a vital matter.

Central States

Silver, Copper, Lead, and Zinc in the Central States in 1916 (82494 N). J. P. Dunlop and B. S. Butler. 105 pp. U S Geol Surv, I:4—Oct. 27, 1917. Statistics of production.

Coal Problems

Some of the Coal Producer's Problems (86793). D. H. McDougall. 1500 w. Can Min JI—June 1, 1918. Presidential address before Min. Soc. of Nova Scotia. Supply and transportation, value, use, price and production.

Copper

The Action of Reducing Gases on Hot Solid Copper (89571 D). Norman B. Pilling. Ills. 2500 w. A I M E, Bul—Oct., 1918. A study of the nature of the action and the conditions under which it occurs.

The Effect of Cold Work on Copper (89330 A). W. E. Alkins. Read before the British Inst. of Metals. 2500 w. Engng—Sept. 13, 1918. An inquiry into the change in tensile strength of copper in the form of wire as it is progressively hardened by cold drawing.

The Spectroscopic Determination of Lead in Copper (89572 D). C. W. Hill, and G. P. Luckey. Ills. 2200 w. A I M E, Bul—Oct., 1918. Development of the method in the factory, giving details of apparatus and its standardization.

Consult Classification of the Index. See page 9.

Copper

BASE METALLURGY

France

Copper (87454). Ills. 100 pp. U S Bur Stds, No. 73—June 25, 1918. Deals primarily with the physical properties of pure and of commercial grades of copper.

Cunningham Pass District, Arizona (87420). W. Tavote. Maps. 1500 w. Min & Sci Pr—July 6, 1918. A district attracting attention for its high-grade copper ore.

Collahuasi La Grande Copper Mines, Tarapaca Province, Chile (82603). Paul T. Bruhl. Ills. 2500 w. Eng & Min JI—Nov. 24, 1917. Details of mineral formation, methods of operation, and climatic conditions.

See Jerome, under Mines and Districts.

The Arbouin Copper Mines at Cardross (82813 N). Lionel C. Ball. Ills. 3500 w. Qnsd Gov Min JI—Oct., 1915. Serial, 1st part. History, geology, ore deposits, mineralogy, mining, and transport.

Mount. Mudlo Copper Mine, Kilki-van (85229 N). E. Cecil Saint-Smith. 1500 w. Qnsd Gov Min JI—Feb., 1918. Ore occurrence.

Quelques Progrès Récents En Metallurgie Du Cuivre (85145 B). L. Guillet. 2300 w. La Nature—March 2, 1918. Recent progress in copper smelting and refining.

Copper in 1916 (86139 N). B. S. Butler. 55 pp. U S Geol Surv, I: 20—Apr. 22, 1918. General report.

The Southwest Copper Field (88037 A). J. R. Finlay. Ills. 5000 w. Eng & Min JI—Aug. 3, 1918. Geologic, economic and climatic aspects of this section.

Some Notes on the Copper Deposits of the Northern Interior of British Columbia (83892 N). John D. Galloway. 2000 w. Can Min Inst, Bul—Jan., 1918. Promising properties and their development.

The Bogomolovsky Copper Mines, Russia (83724). N. T. Truschkoff. Ills & Map. 1500 w. Min & Sci Pr—Jan. 19, 1918. Characteristics of mines; a great pyrite belt; geology; development; costs.

The Lake Superior Copper Country (83622). Homer Guck. Ills. 1500 w. Min & Sci Pr—Jan. 12, 1918. Story of the Calumet & Hecla development.

Ajo Copper Mine (83878). Courtenay De Kalb. Ills. 3000 w. Min & Sci Pr—Jan. 26, 1918. Serial, 1st part. Production; history of development; geology, etc.

Andes Copper Mining Co.'s Development at Potrerillos, Chile (83733). James E. Harding. Ills. 1200 w. Eng & Min JI—Jan. 19, 1918. At an expense of \$25,000,000 a deposit of 1.4 per cent.

copper ore, estimated at 100,000,000 tons, will be exploited by Anaconda.

Progress in Metallurgy of Copper (83736 A). H. C. H. Carpenter. 7500 w. Roy Soc Arts, JI—Jan. 4, 1918. Serial, 1st part. History of the copper production and the reversal of the output; describes the Welsh process of copper smelting and refining; and outlines best modern practice in United States.

The Physical Properties of Copper and the Factors by Which They Are Affected (84070 A). Paul D. Merica. Ills. 4000 w. Met & Chem Eng—Feb. 1, 1918. Serial, 1st part. Compilation of available information.

Bibliography on the Physical Properties of Copper (85682 A). Paul D. Merica. 5 pp. Met & Chem Eng—April 15, 1918. Sources of information classified by topics.

Sacramento Hill Disseminated Copper Deposits (85770). Courtenay De Kalb. Ills. 2000 w. Min & Sci Pr—April 20, 1918. Serial, 1st part. Early history of the Bisbee copper mines; methods and cost of development.

Determining Copper Minerals in Partly Oxidized Ores (86901 A). Felix Cremer. 3000 w. Met & Chem Eng—June 15, 1918. Comparative merits of the various methods. The important effects of grinding and of iron are also discussed.

Copper Castings

Copper Castings for Electrical Purposes (88306). G. F. Comstock. 1200 w. Br Wld—Aug., 1918. Development of copper purification.

Copper Determination

Iodide Copper Method With Sodium Fluoride (87259). A. L. Reese. 1000 w. Eng & Min JI—June 29, 1918. Details of the process.

Copper Recovery

Sulphur Dioxide Method for Determining Copper Minerals in Partly Oxidized Ores (84278 A). Charles E. Van Barneveld and Edmund S. Leaver. 3000 w. Met & Chem Eng—Feb. 15, 1918. Rapid method.

Copper Refining

The Furnace Refining of Copper (82430 A). Lawrence Addicks. 7500 w. Met & Chem Eng—Nov. 15, 1917. Details of the various operations and influencing factors.

France

La Métallurgie Française (89723 E). L. Guillet. Charts. 4300 w. Soc Ingénieurs Civils De France—April-June, 1918. Past and future of metallurgy in France. Statistics of iron, steel, copper, lead, zinc, tin, aluminum and nickel.

BASE METALLURGY

Zinc

Furnace

New Merton Roasting Furnace for Blende (89180 A). Ills. 700 w. Eng & Min JI—Sept. 28, 1918. A new type adapted for roasting zinc blende but available for other materials.

Hydro-Metallurgy

Hydro-Metallurgy of Copper Sulphides (82535). A. E. Drucker. Ills. 1800 w. Min & Sci Pr—Nov. 17, 1917. Treatment of copper-concentrate at the mines.

Indo-China

Zinc-Smelting Possibilities in Tonkin, Indo-China (84305). Abstract of paper by A. Lochard. 2500 w. Eng & Min JI—Feb. 16, 1918. Review of conditions where natural resources promise profitable development.

Lead

The Lead Situation in Canada (82-979 N). Alfred Stansfield. 1500 w. Can Min Inst, Bul—Dec., 1917. Explains the situation, considering it under five stated heads.

The Kingdon Lead Mine (84509 N). John E. Hardman. Ills. 2000 w. Can Min Inst, Trans—1917. History of this property.

Lead and Zinc

Le Lavage Des Minerais De Plomb Et De Zinc (84606 B). Ills. 1500 w. Le Génie Civil—Jan. 12, 1918. Serial, 1st part. Treatment of lead and zinc ore by washing.

Metallography

Metallography Applied to Nonferrous Metals—I (88570). Ernest J. Davis. Ills. 2500 w. Fndry—Sept., 1918. Serial, 1st part. Deals with the science that embraces a study of the internal structure of metals.

Metallography and the War (89381 A). Zay Jeffries. 2500 w. Chem & Met Eng—Sept. 28, 1918. Production of metals for specific uses; war uses for metallography; new and special fields.

Metallurgical Analysis

Speeding Up Metallurgical Analysis (89377). Harold C. Parish. 4000 w. Comments on the analyst's part in production; selection of rapid and accurate methods, etc.

Metallurgy

Metallurgy and the War (83225 A). 3000 w. Pahasapa Qr—Dec., 1917. The development of copper.

Missouri

The Mining District of Joplin and Southeast Missouri (83188). H. W. Kitson. Ills. & Map. 5000 w. Eng & Min JI—Dec. 22, 1917. Serial, 1st part. Geological outline of the ore deposits in the zinc and lead districts.

Ore Deposits

Principles Governing Zinc-Ore Deposits (82216). Frank L. Nason. 3000 w. Min & Sci Pr—Nov. 3, 1917. Effect observed on fissures, contacts between sedimentaries and eruptives, etc., in relation to the origin and genesis of zinc ores.

Reverberatory Practice

Development of Reverberatory Practice at Copper Cliff, Ont (83190). Charles F. Mason. 1200 w. Eng & Min JI—Dec. 22, 1917. Describes development of side-wall charging, and the changes in furnace construction required.

Slag

Matte-Settlement and Slag-Disposal at Grand Forks (86954). Walter B. Bishop. Ills. 2500 w. Min & Sci Pr—June 15, 1918. Methods used and details of operation.

Spelter

The British Spelter Industry (84839 A). 3000 w. Engng—Feb. 15, 1918. Serial, 1st part. Position of England with reference to spelter; what zinc plants have to do; and how to supply the needs of the country.

Tin

The Tin Field of North Dundas (88170 N). Hartwell Conder. Maps & Ills. 96 pp. Tas Geol Surv Bul—No. 26. History of mining on the field, physiography, geology, mining properties, etc.

Tin Dredging in Portugal (83279). Frederick W. Foote and Rastus S. Ransom, Jr. Ills. 1000 w. Eng & Min JI—Dec. 29, 1917. American successful operation on the east side of Sierra Estrella mountains. Dredge operated by electricity.

Apuntes Acerca De Criaderos Estancieros En Mexico (85866 D). 7100 w. Boletín Minero—Dec., 1917. Notes on tin deposits in various parts of Mexico. Digest of reports of the Mexican Geological Institute.

Waste Metal

La Récupération Et L'Utilisation (89083 B). P. Razous. Ills. 4000 w. Génie Civil—Aug. 31, 1918. Serial, 1st part. Recovery and utilization of waste of copper, zinc, tin, lead, aluminum and their alloys. Processes and machines.

Zinc

Research Preparedness in the Zinc Industry (87246 A). Parker C. Choate. 3000 w. Chem & Met Eng—July 1, 1918. Phases of zinc metallurgy on which research is desirable.

A New Method of Estimating Zinc in Zinc Dust (88356 A). L. A. Wilson. Ills. 2500 w. Eng & Min JI—Aug. 24,

Zinc**BASE METALLURGY****Anthracite**

1918. Improved hydrogen evolution for chemical analysis of zinc dust.

Benefits To Be Derived From Close Coöperation of Zinc Mining and Smelting Interests In Helping Win the War (88039 A). W. R. Ingalls. 5000 w. Eng & Min JI—Aug. 3, 1918. Address before Am. Zinc Inst., in St. Louis. Review of the industry in the United States.

Spelter Statistics for 1917 (87864 A). W. R. Ingalls. 5500 w. Eng & Min JI—July 27, 1918. Revised statistics of production in the United States in 1917.

Zinc in Missouri, Kansas, Oklahoma and Arkansas (88283 A). Otto Ruhl. 2000 w. Eng & Min JI—Aug. 17, 1918. Zinc concentrates, prices, cost, etc.

Losses in Zinc Metallurgy (82792). 1200 w. Eng & Min JI—Dec. 1, 1917. Sources of waste, methods of prevention and suggestion for improvements.

Electrolytic Zinc (84961 D). C. A. Hansen. 29 pp. A I M E, Bul—March, 1918. Power characteristics, impurities in zinc electrolyte, and other data based on experiments.

The Kansas-Oklahoma-Missouri, or Kornspelter Zinc Region (84714). T. A. Rickard. Map & Ills. 4000 w. Min & Sci Pr—March 2, 1918. Serial, 1st part. Output of zinc-lead concentrate.

Joplin and the Kornspelter Region (83491). Otto Ruhl. 1500 w. Min & Sci Pr—Jan. 5, 1918. Depression in the zinc industry.

The Wisconsin Zinc District (83877 D). H. C. George. Ills. 30 pp. A I M E—Dec., 1917. Mines, scattered deposits, production, etc.

Roasting Zinc Ore for Leaching (85616). Floyd Dixie James. 1800 w. Min & Sci Pr—April 13, 1918. Abstract from Bul. Missouri Sch. of Mines & Met.

Oxidizing and sulphatizing roast; formation of zinc ferrite; leaching the calcine.

Recovery of Spelter and the Treatment of Retort Residues (84073 A). Edward Mackay Johnson. 3000 w. Met & Chem Eng—Feb. 1, 1918. Information on the recovery and sampling of spelter, with cost figures on the jigging and smelting of retort residues.

The Hydrometallurgy and Electrolytic Precipitation of Zinc (84234 N). 21 pp. Sch Mines & Met, Mo., Bul—Aug., 1917. Information available and results of experiments.

Fine - grinding and Porous - briquetting of the Zinc Charge (84363 D). Woolsey McA. Johnson. 1500 w. A I M E, Bul—Feb., 1918. Necessary characteristics of the zinc-retorting charge showing how the coal can be reduced.

Electrolytic Zinc (89568 D). C. A. Hansen. 1800 w. A I M E, Bul—Oct., 1918. Discussion of C. A. Hansen's paper.

Zinc Refining (82500 D). Leland E. Wemple. Ills. 14 pp. A I M E, Bul—Nov., 1917. Methods of preventing contamination and methods of refining.

Zinc Ferrate

The Formation of Zinc Ferrate (84508 N). E. H. Hamilton, G. Murray, and D. McIntosh. 1800 w. Can Min Inst, Trans—1917. Explanation of the low solubility of some roasted zinc ores in dilute sulphuric acid.

Zinc Ore

Utilization of the Sulphur Contents of Zinc Ore (82789 A). H. M. Ridge. Ills. 4000 w. Aust Min Stand—Oct. 25, 1917. Read before the London Sec. of Soc. of Chem. Ind. This supply of sulphuric acid.

COAL AND COKE**Afforestation**

Afforestation and Coal Mining (88867 A). 2200 W. Colly Gdn—Aug. 30, 1918. The pressing need of Government action in the afforestation of Great Britain, with suggestions.

Air Compressor

Turbo Air Compressor at the Holbrook Colliery (88618 A). Ills. 2000 w. Engr—Aug. 9, 1918. Details of plant recently erected at Birmingham, Eng.

American Coals

Fusibility of Ash from West Virginia Coals (89518). Walter A. Selvig. Tables. 1000 w. Power—Oct. 15, 1918. Results of a general survey, by the Bureau of

Mines, of the softening temperatures of the ash from American coals.

Ammonia

Ammonia From Coal (89072). 2200 w. Times Engng Supp—Aug., 1918. "Direct" methods of recovery as practiced in Great Britain.

Anthracite

Methods of Mining in the Pennsylvania Anthracite Field (83116 N). Hugh M. Crankshaw, with discussion. Ills. 6000 w. Instn Min Engrs, Trans—Nov., 1917. Methods of working to meet conditions.

Anthracite Industry in 1917 (83712). Edward W. Parker. 3000 w. Cl Age—Jan. 19, 1918. Important features of the

Belgium

anthracite industry during the year.

Anthracite in New England in 1917 (83714). G. G. Wolkins. 1200 w. Cl Age—Jan. 19, 1918. Slow and inadequate deliveries. Increased costs.

Mining anthracite in the Pennsylvania Wyoming Region in 1917 (83825). J. H. Haertter. 1200 w. Cl Age—Jan. 26, 1918. Production, methods, electric locomotives.

Résumé of the Anthracite Industry in 1917 (83823). H. M. Crankshaw. Ills. 1000 w. Cl Age—Jan. 26, 1918. Methods adopted to increase production.

Belgium

Coal and Coke in Belgium Before and After the War (89102 A). 3000 w. Ir & Cl Trds Rev—Sept. 6, 1918. Abstract translation of article by Georges Didier, in *La Revue Belge* on the coal output and trade before the war and suggested means for ousting the German coal after the war.

Benzols

Comparative Values of Coke Oven Crude Benzols (84432 A). B. W. Haigh and H. Lamb. 3500 w. Colly Gdn—Feb. 1, 1918. From paper read before the Coke Oven Mgrs. Assn. Research work and results.

Bituminous

Montour No. 8 Plant of the Pittsburgh Coal Co. (85336). George W. Harris. Maps & Ills. 2500 w. Cl Age—March 30, 1918. Description of plant with details of the No. 8 tippie.

Blackdamp

The Origin of Blackdamp (88883 N). J. Ivon Graham, with discussion. 18 pp. Instn Min Engrs, Trans—Aug.-Sept., 1918. Composition of black damp and sources of the carbon dioxide and nitrogen.

Blacksmithing

Blacksmithing at Coal Mines (84301). J. F. Springer. Ills. 5000 w. Cl Age—Feb. 16, 1918. Methods of annealing steels; tempering of bits, etc.

Breaker

The Drifton Breaker (84338 D). Effingham P. Humphrey. Ills. 3800 w. A I M E, Bul—Feb., 1918. Rebuilding and remodeling of the first iron breaker erected in the anthracite region.

Breakers

Successful Steel Breakers of the Lehigh Valley Coal Company (85620). George W. Harris. Ills. 4500 w. Cl Age—April 13, 1918. Details of steel breakers which are supplanting the wooden structures.

The Mineral Spring Breaker (84951). Dever C. Ashmead. Ills. 2500 w. Cl Age—March 16, 1918. Wilkes-Barre, Pa.

Brickwork

Safe Compressive Stresses on Colliery Brickwork (82371 A). W. C. Popple-

COAL AND COKE**Canada**

well. 2500 w. Colly Gdn—Oct. 26, 1917. Data obtained in tests.

Brick Works

The Wrenthorpe Brick Works (87754 A). Ills. 2500 w. Ir & Cl Trds Rev—June 28, 1918. Details of works illustrating a practical method of turning colliery refuse to commercial account.

Briquettes

A Modern Belgian Briquette Factory, with the "Cava" Pitch Process (83750 A). E. Gevers-Orban. Ills. 1600 w. Colly Gdn—Dec. 28, 1917. Details of factory and methods.

Briquetting

Briquetting of Anthracite Coal (83865 D). W. P. Frey. Ills. 2000 w. A I M E, Bul—Jan., 1918. Explains how success has been attained.

British Coal

The War and British Coal Supplies (88237). Mark Meredith. 5000 w. Cl Age—Aug. 15, 1918. Coal industry, and economies under government regulation.

British Columbia

Coal in British Columbia (82577). E. Jacobs. 4500 w. Can Min JI—Nov. 15, 1917. Review of the coal production and deposits.

Brown Coal

See same heading under ELECTRICAL ENGINEERING, *Generating Stations*.

By-Products

Coal By-Products and the War (82419 A). A. S. Knowles. 3500 w. E Cb St L, JI—Sept.-Oct., 1917. The coal supply and the industries depending on it.

Byproducts

The Wastage of Coke Byproducts (88150 A). Frederick MacCoy. Ills. 1000 w. Eng & Min JI—Aug. 10, 1918. Plea for more extended use of the by-product coking oven.

Coke-Oven By-Products in 1917 (87901 A). 4500 w. Colly Gdn—July 12, 1918. Report under the Alkali Works act.

Cables

The Care and Testing of Colliery Cables (86381 A). A. F. W. Richards. Read before meeting at Stoke-on-Trent. Ills. 6000 w. Ir & Cl Trds Rev—Mar. 22, 1918.

Caging

Caging Arrangements at Deep Mines (82481). Roland Gascoyne. 1800 w. Cl Age—Nov. 17, 1917. Devices for hoisting more than one car at a time.

Canada

The Production of Coal and Coke in Canada During the Calendar Year 1916 (82890 N). John McLeish. 46 pp. Can Dept Mines—No. 465. Statistics,

COAL AND COKE

Coal Age

Canada Fuels

The Fuels of Canada (84044). B. F. Haanel. 6000 w. Can Engr—Jan. 31, 1918. Need of bettering the fuel situation in certain sections.

Canadian Fuels

Fuels of Western Canada (88805). James White. 1700 w. Can Engr—Sept. 12, 1918. Excerpts from paper read before Eng. Inst. of Canada. Coal, natural gas, petroleum, electricity, peat and wood.

Carbocoal

Carbocoal (89569 D). C. T. Malcolhnson. 4500 w. A I M E, Bul—Oct., 1918. Discussion of C. T. Malcolhnson's paper.

Carbocoal (86411 D). Charles T. Malcolmnson. 2500 w. A I M E, Bul—May, 1918. Process for the manufacture of smokeless fuel from high-volatile coals, and recovery and refinement of coal-tar products derived. Characteristics, uses, etc.

Carbon

X-Rays and the Structure of Crystallized and Amorphous Carbon (83128 A). 1500 w. Engng—Dec. 7, 1917. Examinations tending to show only two modifications of carbon instead of three.

Carbonization

The Low Temperature Carbonization of Coals (84530 N). J. L. Stevens. 5000 w. Chem Eng & Min Rev—Jan., 1918. Serial, 1st part. Reviews attempts made and suggests lines for future development.

Carbonization Reactions (89530 A). J. W. Cobb. William Young memorial lecture delivered at Glasgow. 5500 w. Colly Ydn—Sept. 27, 1918. Of particular interest to the gas industry.

Carbonization of Coal (89325 A). Wallace Savage. Ills. 2000 w. Chem & Met Eng—Oct. 1, 1918. Rapid advances being made in coal distillation field.

Carbonization of Illinois Coals in Inclined Gas Retorts (85039 N). F. K. Ovitiz. 18 pp. Ill. Geol Surv—Bul. 20. Description and discussion of tests.

Low-Temperature Carbonization (88133 A). Edgar C. Evans. Abstract of paper before Soc. of Chem. Ind. 4000 w. Colly Gdn—July 26, 1918. Differences between high and low carbonization.

Coal

Coal Thrift (84856 A). 2500 w. E Ch Phila, Jl—March, 1918. Suggestions of "Committee on Fuel Conservation of Engineers' Club, Phila.

The Micro-Chemical Examination of Coal (87356 A). 4500 w. Colly Gdn—June 14, 1918. Reviews paper by J. Lomax on research work, methods, results, etc.

Determination of Sulphur in Coal (86333). Edwin M. Chance. 1800 w. Cl Age—May 18, 1918. Precautions needed to secure a correct evaluation of the sulphur.

Coal, Explosives, War—I. (87853). H. J. Broughton. Ills. 3000 w. Cl Age—July 25, 1918. Serial, 1st part. Relation that coal bears to business and particularly to the conduct of war.

The Coal Operators of America Defended (82989). A. W. Dean. 1500 w. Mfrs' Rec—Dec. 13, 1917. Statement on the proposed pooling plan.

The Coal Problem (82289 A). 2000 w. Engr—Oct. 19, 1917. The situation in Great Britain.

Theories Modernes Sur La Constitution Chimique Des Houilles (82665 B). 5200 w. Génie Civil—Oct. 20, 1917. Serial, 1st part. Modern theories of chemical combination in coal of various grades.

L'Utilisation Rationnelle Du Charbon En Allemagne (82669 B). R. Schmutz. Ills. 5400 w. Génie Civil—Nov. 3, 1917. The utilization of coal in Germany and the complete gasification of solid combustible.

Coal and Its Selection (84000). Walter N. Polakov. 4500 w. Pwr Pt Eng—Feb. 1, 1918. Coal formation and qualities, proper selection and use.

Le Nouveau Bassin Houiller De Lyon (89064 B). A. Pawlowski. 3100 w. La Nature—Aug. 24, 1918. Results of exploration in coal fields near the Rhone.

The Scarcity and Cost of Coal (88847 A). 2000 w. Engng—Aug. 16, 1918. Editorial discussion of conditions and outlook in Great Britain.

Coalfield Developments and Extensions (88861 A). Maps. 2500 w. Ir & Cl Trds Rev—Aug. 23, 1918. Information from report of Geological Sub-committee, and included in final report of Coal Conservation Committee. On possible extensions of Coalfields in Great Britain.

The Future of Coal Using (88591 A). W. H. Booth. 1200 w. Elec Rev—Aug. 9, 1918. Discusses points in the Interim Report of the Reconstruction Committee dealing with the power question and saving of waste heat.

The Waterlogged Coal Area in South Staffordshire (88868 A). 1500 w. Colly Gdn—Aug. 30, 1918. Note from the Final Report of the Mining Sub-committee. Account of British districts waterlogged and matters relating to recovery of coal.

Coal Age

The Forests of the Coal Age (83111 N). D. H. Scott, with discussion. Ills. 30 pp. Instn Min Engrs, Trans—Nov.,

Coal Analysis

1917. From the viewpoint of the botanist.

Coal Analyses

Sur Le Dosage Du Carbone Total Dans Les Combustibles (85113 C+D). E. Damour and M. De La Morinière. Ills. 5600 w. *Revue De Métallurgie*—Nov.-Dec., 1917. Determination of total carbon content of combustibles, and its economic importance.

Analyses of Mine and Car Samples of Coal Collected in the Fiscal Years 1913 to 1916 (87833 B). Arno C. Fieldner, Howard I. Smith, J. W. Paul, and Samuel Sanford. 456 pp. U S Bur Mines—Bul 123. Sampling and analytical methods with tabulated analyses.

Coal Breaker

A Modern Anthracite Preparation Plant (83141). D. C. Ashmead. Ills. 2000 w. *CI Age*—Dec. 22, 1917. Detailed description of the Loomis breaker near Nanticoke, Penn.

Coal Conservation

Interim Report of the Coal Conservation Sub-Committee of the Reconstruction Committee (83743 A). Abstract, with editorial. 1000 w. *Elec'n*—Dec. 28, 1917. Report on electric power supply in Great Britain. Waste of coal.

Coal Conservation in New England (87737 A). Dr. Ira N. Hollis. 6000 w. *Ind Man*—August, 1918. Outline of the fuel situation showing how methods of economy and conservation may offset a 20% shortage.

Coal Distillation

The Distillation of Coal in a Vacuum (89359 A). Amé Pictet. 5000 w. *Chem & Met Eng*—Sept. 25, 1918. Nature of products obtained.

Low-temperature Distillation of Illinois and Indiana Coals (88772 D). G. W. Traer. 7 pp. *A I M E*, Bul—Sept., 1918. Details of a Chicago experimental plant and its operation and results.

Coal Distribution

Zone System for the Distribution of Bituminous Coal (86228). Map. 4 pp. *CI Age*—May 11, 1918. Order of the Fuel Administration, with key to consuming districts.

Coal Economy

Coal Economy from a National Standpoint (84835 A). W. H. Casmey. 4000 w. *Colly Gdn*—Feb. 15, 1918. From paper before Manchester Geol. & Min. Soc. Indicates present waste and suggests remedies.

Coal Fields

The Dombrova Coal Fields (87975 A). Arthur E. Gurney. 1800 w. *Colly Gdn*—July 19, 1918. Mines in Poland.

COAL AND COKE

Coal Prices

Note on the Correlation of Certain Seams in the Yorkshire Coalfield (83-112 N). Percy Fry Kendall, with discussion. Plate. 3500 w. *Instn Min Engrs*, Trans—Nov., 1917. Examines existing information.

The Areas and Deposition of the Coalfields of Western Europe (83113 N). G. Blake Walker, with discussion. 2 plates. 15 pp. *Instn Min Engrs*, Trans—Nov., 1917. Reviews the history of the Carboniferous Period.

Coal Field Surveys in New Zealand (84018 A). 1500 w. *Colly Gdn*—Jan. 11, 1918. Information from eleventh annual report of the Mines Department.

Coal Gas

See same heading under **MECHANICAL ENGINEERING, Automobiles.**

Coal Handling

New Methods of Handling Coal Electrically (86334). C. L. Packard. Ills. 1500 w. *CI Age*—May 18, 1918. Improvements introduced recently at a plant of H. C. Frick Coke Co.

See also same heading under **MECHANICAL ENGINEERING, Transporting and Conveying.**

Coal Industry

The Coal Industry's Part in the War (89473). John J. Cornwell. 3500 w. *CI Age*—Oct. 10, 1918. Substance of address by Governor of W. Va. at White Sulphur Springs, for the purpose of stimulating coal production.

Coal Measures

Geological Structure of the Forest of Dean (82550 A). T. Franklin Sibly. 2000 w. *Colly Gdn*—Nov. 2, 1917. Geological study of the coal measures.

Coal Mines

Mud Injection in Coal Mines (86211 A). Ills. 3300 w. *Engng*—April 12, 1918. M. Plassard urges this plan for extinguishing fires in collieries, for recovery of coal under unfavorable conditions, and for ensuring greater safety.

Coal Plant

Preparing No. 3 Pocahontas Coal (84-209). Richard G. Miller. Ills. 1000 w. *CI Age*—Feb. 9, 1918. Type of plant and machinery adopted; conveying machinery described.

Coal Prices

Method of Fixing Prices of Bituminous Coal Adopted by the United States Fuel Administration (88770 D). Cyrus Garnsey, Jr., R. V. Norris, and J. H. Allport. Map. 22 pp. *A I M E*, Bul—Sept., 1918. Explains methods, discussing their advantages and disadvantages.

COAL AND COKE

Coal Slack

Coal Problem

Better Handling of Coal Problem Needed (84212). 2000 w. Elec Wld—Feb. 9, 1918. Essentials to meet the present enormous fuel requirements.

The Coal Problem Under War Conditions (88474). H. H. Stock. 4000 w. Cl Age—Aug. 29, 1918. Suggestions for coal storage and other problems.

Corrective Steps for Our Coal Problem (83856). Ills. 2000 w. Elec Wld—Jan. 26, 1918. Serial, 1st part. Critical question of coal supply and cost; suggestions.

Review of the Coal Situation of the World (83864 D). George S. Rice. 5500 w. A I M E, Bul—Jan., 1918. The resources, production, consumption, exports and imports, etc.

The Coal Problem (84853). E. G. Bailey. Lecture at Johns Hopkins University. 6000 w. Power—March 12, 1918. Impurities in coal.

Coal Production

Loss and Waste in Coal Production (89047 A). 10500 w. Ir & Cl Trds Rev—Aug. 30, 1918. From final report of the Coal Conservation Committee. Gives sub-committee report considering improvements that can be effected in methods of mining coal with a view to prevent loss and minimize cost.

Coal Restrictions

Coal Consumption Restrictions Government Proposes to Enforce (87480). 1200 w. Mfrs Rec—July 11, 1918. Discusses the programme for saving fuel.

Coal Rights

Provincial Rights Dispute in Canada (88328). Robert Dunn. Map. 1500 w. Cl Age—Aug. 22, 1918. Title to coal-bearing lands of Vancouver Island in dispute.

Coal Run Plant

New Plant and Mines of the Coal Run Mining Company (85492). Dever C. Ashmead. Ills. 2500 w. Cl Age—April 6, 1918. Details of new plant.

Coal Sales

Revised Directions as to the Sale of Coal (84672 A). 7000 w. Colly Gdn—Feb. 8, 1918. Alterations made in Directions dated Oct. 12, 1917.

Directions as to the Sale of Coal (82284 A). 2500 w. Colly Gdn—Oct. 19, 1917. Amendments made to the directions as to the sale of coal in the United Kingdom.

Coal Saving

Coal Saving at Collieries by Economical Steam Raising (85258 A). D. Brownlie. 4400 w. Colly Gdn—March 1, 1918. Discusses possible improve-

ments in the economical generation of steam.

A Talk to Firemen on Saving Coal (83828). Charles H. Bromley. 2500 w. Power—Jan. 29, 1918. From lecture at Baltimore. Most important way of getting the most out of coal.

Coal Seams

Notes on Faults and Rolls in Coal Seams (87886 A). Idris Thomas. Ills. 2500 w. Ir & Cl Trds Rev—May 31, 1918. Read before S. Wales Branch of Natl. Assn. Colly. Mgrs. Personal observations.

On the Splitting of Coal-Seams by Partings of Dirt (86317 N). Percy Fry Kendall, with short discussion. Ills. 3 plates. 20 pp. Instn Min Engrs, Trans—April, 1918. Serial, 1st part. Deals with splits that rejoin.

On the Splitting of Coal Seams by Partings of Dirt (82825 A). P. F. Kendall, with discussion. Read before the Midland Inst. of Min., Civ. & Mech. Engrs. 7000 w. Colly Gdn—Nov. 9, 1917. Serial, 1st part. The present article deals with splits that rejoin.

Coal Shortage

Facing the Fact of Coal Shortage (83684). 1500 w. Elec Wld—Jan. 19, 1918. Conditions of supply serious for central stations.

Why and Wherefore of the Coal Shortage (83476). J. D. A. Morrow. 2800 w. Cl Age—Jan. 5, 1918. Lack of transportation the primary cause. Also discusses features of the situation.

Coal Situation

The Coal Situation—A National Menace (83146). J. D. A. Morrow, with editorial. 2000 w. Ry Age Gaz—Dec. 21, 1917. A letter replying to an earlier editorial, with reply.

War's Influence on the Coal Situation (83038). Charles H. Bromley. 3000 w. Power—Dec. 18, 1917. Analysis, particularly as related to its use in the industries.

Rate Increases to Follow High Cost of Coal (84061). 2500 w. Elec Wld—Feb. 2, 1918. Serial, 1st part. Phases of the critical coal situation.

Some Why's of the Coal Shortage (84540). 2500 w. Power—Feb. 26, 1918. Enumerates some of the causes.

While the Idle Millions Shiver (84066). Ills. 1200 w. Power—Feb. 5, 1918. Conditions at Perth Amboy, N. J., causing great suffering in New York City.

Coal Slack

Flow of Air Through Small Coal and Other Broken Material (87358 A). J.

Coal Storage

T. Storrow. Tables. 1000 w. Colly Gdn—June 14, 1918. Report to Instn. of Min. Engrs. Experiments to ascertain the influence of size on the rate of flow under different conditions.

Coal Storage

The Storage of Bituminous Coal (86089). H. H. Stoeck. 1200 w. Ry Rev—May 4, 1918. Résumé of a discussion before the Western Soc. of Engrs. Conclusions.

The Storage of Soft Coal (87870). W. L. Abbott. 2000 w. Power—July 30, 1918. Methods of preventing spontaneous combustion.

Coal Storage in Large Quantities (88440 A). H. J. Edsall. Ills. 5000 w. Ind Man—Sept., 1918. Modern methods.

Storing Coal at Moonheart, Illinois (87571). Ills. 1800 w. Power—July 16, 1918. Portable conveyors tied in with the coal-handling equipment. Methods and cost.

Modern Methods for the Storage of Coal (84021 A). George Frederick Zimmer. 3 plates. 5000 w. Engng—Jan. 11, 1918. Serial, 1st part. Need of storage, causes of deterioration, methods, etc.

Coal Storage Basin at Duquesne Lighting Plant (82366). Ills. 1000 w. Power—Nov. 13, 1917. Large reinforced concrete storage basin recently completed at the Brunots Island Power Plant.

Coal Supply

The Problem of Coal Supply (85721 B). Edward W. Parker. Ills. 16 pp. Fkn Inst, J1—April, 1918. Reviews theories of the formation of coal, extent of deposits in the United States, uses, and various phases of the problem.

Coal: The Resource and Its Full Utilization (85495). Abstract of paper by Chester G. Gilman and Joseph E. Pogue. 5000 w. Ry Rev—April 6, 1918. Wastes and possible economies in the use.

See same heading under **ELECTRICAL ENGINEERING, Generating Stations.**

Coal Tar

Methods of Analysis Used in the Coal-Tar Industry—I. Crude Tars (88699 B). J. M. Weiss. Ills. 5000 w. J1 Ind & Eng

Coal Tests

University of Illinois Coal Tests (84-180 A). 2500 w. Ry Mech Engr—Feb., 1918. Comparative high and medium capacity performance of various grades in locomotive service.

Coal Trade

Market Conditions in New England in 1917 (83822). G. G. Wolkins. 6000 w. Cl Age—Jan. 26, 1918. Reviews the general features affecting the coal trade. Philadelphia Coal Trade in 1917

COAL AND COKE**Coke**

(83717). W. D. Hammer. 5000 w. Cl Age—Jan. 19, 1918. Demands not satisfied and margins of profits small.

St. Louis Coal Trade in 1917 (83821). E. J. Wallace. 2500 w. Cl Age—Jan. 26, 1918. Review.

The Coal Trade of 1917 (83751 A). 29500 w. Colly Gdn—Jan. 4, 1918. Review by districts and by methods of trade in Great Britain.

The New York Coal Trade in 1917 (83716). R. W. Morris. 3500 w. Cl Age—Jan. 19, 1918. Many hardships, uncertainties and disappointments. Bunker coal very scarce.

The 1917 Coal Trade of the Northwest (83713). W. L. Kidston. 3500 w. Cl Age—Jan. 19, 1918. Active year—the supply seldom meeting the demand.

The Coal Trade After the War (87755 A). 2500 w. Ir & Cl Trds Rev—June 28, 1918. Serial, 1st part. Report of British Board of Trade Committee.

Problems Confronting the Coal Trade (82581). F. B. Hubbell. 2500 w. Mfrs' Rec—Nov. 22, 1917. Outlines history of coal mining in the United States, and calls attention to mistakes made.

The Future of the Coal Trade of the Empire (84523 N). Allan Greenwell, with discussion. 12 pp. Can Min Inst, Trans—1917. Effects of the war, and general review.

Coal Washing

Coal Washing: A Scientific Study (86316 N). Thomas James Drakeley, with short discussion. 40 pp. Instn Min Engrs, Trans—April, 1918. Scientific aspects of coal washing. Research work.

Coal Waste

See same heading under **MECHANICAL ENGINEERING, Heating and Cooling.**

Preventable Waste of Coal in the United States (82916 A). David Moffat Myers. 8 pp. A S M E—Dec., 1917. Largely through faulty operation of boiler plants.

The Use of Culm and Other Waste Materials from Coal-Washing Plants for Other Purposes (83596 A). John B. C. Kershaw. 4000 w. Met & Chem Eng—Jan. 1, 1918. Reviews progress in utilization of low-grade fuels for power purposes.

Coke

Metallurgical Coke and the Recovery of By-Products (89046 A). Report by W. A. Bone. Appendix I to the Report of the Carbonization Committee. 3000 w. Colly Gdn—Sept. 6, 1918. Recent important developments in by-product coking practice, and related topics.

The Importance of Coke Hardness (87380 N). G. D. Cochrane. Ills. 12

Coke Handling

pp. Ir & St Inst—May, 1918. Its importance in regard to consumption in the blast furnace.

Raising Steam From Coke (87145). 1100 w. Times Engng Supp—May, 1918. Use of mechanical stokers for coke firing.

The Importance of Coke Hardness (86706 A). G. D. Cochrane. From paper read before Iron & Steel Inst. 1200 w. Colly Gdn—May 3, 1918. Effect of hardness on coke consumption.

By-Product Coke and Coking Operations (82915 A). C. J. Ramsburg and F. W. Sperr, Jr. Ills. 32 pp. A S M E—Dec., 1917. Account of the generally accepted theory. Methods employed.

The Determination of Moisture in Coke (82889). A. C. Fieldner and W. A. Selvig. 2500 w. U S Bur Mines—Tech. paper 148. Investigations to determine the most rapid and simple method for use in purchasing coke.

Byproduct Coke and Coking Operations (85944). C. J. Ramsburg and F. W. Sperr, Jr. Ills. 4000 w. Cl Age—April 27, 1918. Serial, 1st part. Information relating to this important industry.

Coke as Blast-Furnace Fuel (86388 A). G. W. Hewson. Abstract of paper and discussion before Soc. of Chem. Ind. 1800 w. Ir & Cl Trds Rev—April 5, 1918. Considered satisfactory if the hardness number is above 94.

Coke Handling

Coke Handling Plant at Warrington Gasworks (82840 A). Ills. 1500 w. Engr—Nov. 16, 1917. An example of coke handling by telfer.

Coke Industry

An Innovation in the Coke Industry (88071). John L. Gans. 2000 w. Cl Age—Aug. 8, 1918. Byproduct-coke manufacturer at Swedeland, Penn.

Development of the Coke Industry in Colorado, Utah, and New Mexico (88208 D). F. C. Miller. 4 pp. A I M E, Bul—Aug., 1918. Reviews the history.

Coke Loading

Loading Door for Coke Ramps (86772 A). H. Hermanns, in *Glückauf*. Ills. 800 w. Colly Gdn—May 10, 1918. Detailed description of a new type of door.

Coke Ovens

By-Product Coke Oven Installation on Tess-Side (86719 A). Ills. 1200 w. Engr—May 10, 1918. Installation at Thornaby iron-works described.

Rock Salt in Coke Oven Saturators (86704 A). G. A. Phillipson, with dis-

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cussion. 2000 w. Colly Gdn—May 3, 1918. Some reasons for the formation of rock salt in saturators.

Chemists in Coke Oven Practice (85697 A). J. T. Dunn, with discussion. (Abstract.) 4500 w. Colly Gdn—March 28, 1918. The necessity for the employment of skilled chemists.

The Texture of Coke Oven Bricks (85696 A). W. G. Fearnside, with discussion. (Abstract.) 3500 w. Colly Gdn—March 28, 1918. Results of research. Description of tests.

New Regenerative Coke Oven Plant at Thornaby Ironworks (86346 A). Frederick C. Coleman. Ills. 1400 w. Colly Gdn—April 19, 1918. Detailed description.

The Byproduct Coke Oven and Its Products (84960 D). William Hutton Blauvelt. Ills. 18 pp. A I M E, Bul—March, 1918. Discussion of the development.

New Coke Ovens and By-Product Plant at Bearpark Brancepeth Colliery, Durham (82147 A). Ills. 1500 w. Ir & Cl Trds Rev—Oct. 12, 1917. Ovens of the Simon-Carves latest type horizontal-flued waste-heat design. Details of installation.

Modern Rectangular Coke-Oven Plant (84451). Dever C. Ashmead. Ills. 2000 w. Cl Age—Feb. 23, 1918. Modern plant with details of mechanical apparatus.

Preventing Leakage in Coke Ovens (84016 A). H. Grahn in *Glückauf*. Ills. 6000 w. Colly Gdn—Jan. 11, 1918. Methods of preventing losses from leakage.

Power Plant Installations for By-product Coke Oven Plants (83894 A). George B. Evans. 2500 w. E Cb St L, JI—Nov.-Dec., 1917. Describes installation in St. Louis plant.

Saline Corrosion of Coke Oven Walls (83749 A). H. Schwenke, in *Glückauf*. Ills. 1500 w. Colly Gdn—Dec. 28, 1917. Methods of prolonging the life of oven linings, and repairing them.

Coking

Some Characteristics of American Coals in By-Product Coking Practice (88196 B). F. W. Sperr, Jr. Ills. 30 pp. Fkn Inst, JI—Aug., 1918. Importance of the development.

Recent Developments in By-Product Coking (83154 A). George Blake Walker. 2500 w. Jr & Cl Trds Rev—Dec. 7, 1917. Abstract of paper before Instn of Civ. Engrs. Methods of charging ovens, recovering of by-products, etc.

Coking

Coking Coals

Recent Advances in By-Product Coking in the United Kingdom (82605). J. B. C. Kershaw. 3000 w. Cl Age—Nov. 24, 1917. By-product coking stimulated by war. Benzol and toluol chief source of profit.

Coking Coals

The Occurrence of Coking Coals in Scotland (84832 A). Robert W. Dron. From a paper before the Min. Inst. of Scotland. 1400 w. Colly Gdn—Feb. 15, 1918. Results of extensive investigations.

Collieries

The Britannia Colliery, Pengam, Mon. (88132 A). George Hann. From a paper before S. Wales Inst. of Engrs. Ills. 4500 w. Colly Gdn—July 26, 1918. Machinery electrically driven—No steam boilers at the colliery.

Notes on Colliery Turbo Plant (85413 A). L. Fokes. Ills. 4500 w. Colly Gdn—March 15, 1918. General principles of operation.

Useful Instruments for Colliery Power Plants (85412 A). H. W. Ravenshaw, with discussion. Read before Midland Inst. of Min, Civ, & Mech Engrs. Ills. 8500 w. Colly Gdn—March 15, 1918. Calls attention to various means of maintaining efficiency and safety.

Colliery Plants

Some Useful Instruments for Colliery Power Plants (86380 A). H. W. Ravenshaw. Abstract of paper and discussion before the Midland Inst. of Min., Civ. & Mech. Engrs. Ills. 3000 w. Ir & Cl Trds Rev—March 15, 1918. Deals mainly with recording and measuring instruments.

Notes on the Extending of Colliery Three-Phase Electrical Power Plant (86392 A). L. Fokes. 4500 w. Ir & Cl Trds Rev—April 12, 1918. Serial, 1st part. Considerations when ordering new plant to ensure that no difficulties will be encountered.

Combustion

Spontaneous Combustion (87613 D). M. W. Franklin. 10 pp. Am Soc Ht & Vt Engrs, Jl—July, 1918. Abstract. A study of the conditions for spontaneous combustion, and its prevention. With notes on spontaneous combustion of coal, by the U. S. Bureau of Mines.

Compressed Air

Compressed Air in the Coal Mine (86263). Charles A. Hirschberg. Ills. 2500 w. Com Air—May, 1918. Methods and advantages; applications and work.

Concrete

Concrete in Coal Mine Service (86332).

COAL AND COKE

J. F. Springer. Ills. 4000 w. Cl Age—May 18, 1918. Gives details of applications.

Conservation

Coal Conservation (89153 A). 3000 w. Engng—Aug. 30, 1918. Editorial review of the final report of the Coal Conservation Committee, and the need of conserving British coal.

The Householder and Clause 7 of the Coal Rationing Order (89524 A). Ed. C. De Segundo. 1400 w. Elec Rev—Sept. 27, 1918. Examination of order and discussion of the comparative values of various forms of fuel.

War-time Economies (89256). George B. Pryde. 2500 w. Cl Age—Oct. 3, 1918. War economy as applied to coal mining.

Coal Conservation Committee. Final Report (88767 A). Also editorial. Map. 9000 w. Colly Gdn—Aug. 23, 1918. Serial, 1st part. Committee appointed to consider possible improvements in mining and utilization of new coal fields.

Coal Conservation (84813). David Moffat Myers. Ills. 3000 w. Cl Age—March 9, 1918. On use without waste; true conservation.

Constituents

The Oxidizable Constituents of Coal (83841 N). J. Ivon Graham and James Hill, with discussion. Ills. 27 pp. Instn Min Engrs, Trans—Dec., 1917. Investigations.

Culm

The Utilization of Anthracite Culm (84812). M. S. Hachita. Ills. 3500 w. Cl Age—March 9, 1918. Results obtained by a mixture of culm and bituminous coal.

Reclaiming the Culm Pile (84060). G. D. Evans. Ills. 1000 w. Cl Age—Feb. 2, 1918. One of many plants now shipping to market.

Cutter Bits

Care and Maintenance of Cutter Bits (82334). Adolf F. Fors. 1500 w. Cl Age—Nov. 10, 1917. Sharp bits essential; correctly formed bits suited to conditions; tempering.

Deep Boring

Deep Borings for Coal (88769 A). 1500 w. Colly Gdn—Aug. 23, 1918. The Market Weighton and Kelham borings in Great Britain.

Deep Borings in Yorkshire, Kent and Sussex (83060 A). 2500 w. Colly Gdn—Nov. 23, 1917. Particulars of several deep borings for coal investigated during the year.

Deep Borings

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Fuel Conservation

Dyes

A Permanent American Dyestuff Industry (82432 A). H. Gardner McKerrrow. Address before Nat. Assn. of Cotton Mfrs. 4000 w. Met & Chem Eng—Nov. 15, 1917. Facts on the development of this industry, with a plea for support.

Dye Industry

The British Dye Industry (87350 A). 1800 w. Engr—June 7, 1918. Account of recent development at Huddersfield, Eng.

Economies

Economies in Colliery Electrical Plant (82563 A). H. A. McGuffie. Ills. 4000 w. Ir & Cl Trds Rev—Nov. 2, 1917. Points that would improve the efficiency in many Scottish mines. Presidential address.

Electrical Apparatus

Drying Colliery Electrical Apparatus (83059 A). L. Fokes. Diagrams. 2500 w. Colly Gdn—Nov. 23, 1917. Suggests methods.

Points on the Electrification of Collieries (83062 A). A. C. Nelson. Ills. 6000 w. Colly Gdn—Nov. 30, 1917. Favors the central station supply and gives applications.

Electrification

The Electrification of a Durham Colliery (88851 A). Ills. 2000 w. Engr—Aug. 16, 1918. Serial, 1st part. Detailed description of the Blackhall colliery in which the whole of the machinery is driven electrically.

Explosives

The Use of Permissible Explosives in the Coal Mines of Illinois (85943 A). James R. Fleming and John W. Koster. Ills. 102 pp. U S Bur Mines—Bul. 137. Deals with the use of permissible explosives in the coal mines of Illinois.

Fuel

Fuel Conservatism (85385 A). 7000 w. A S M E, JI—April, 1918. Abstracts of papers by L. P. Breckenridge, and by O. P. Hood, and of discussions.

Maximum Fuel Production With Minimum Fuel Waste (87741 A). David Moffat Myers. 900 w. Ind Man—Aug., 1918. Efforts to stimulate production and eliminate avoidable wastes in view of coal shortage.

The Present Fuel Situation (87781 A). F. F. Uehling. 3000 w. Ind Man—Aug., 1918. Dependence of production upon fuel supply. Need of more intelligent use of recording devices.

Fuel Economy (87445 A). A. P. Wells, with discussion. 5500 w. S & S W Ry Cb, Pro—May, 1918. Outlines

help possible in saving fuel by those handling it.

The Economical Use of Fuel (87303 A). Ills. 57 pp. A S M E, JI—July, 1918. A symposium contributed to the Worcester meeting, June, 1918, on the conservation of fuel.

Coaling Plants and Fuel (83340 A). W. T. Krausch, with discussion. 9500 w. West Ry Cb, Pro—Nov. 19, 1917. Main features controlling design of plants, fuel economy, etc.

Fuel Conservation (83955 D). I. Economy in Fuel. Perry West. II. Conservation of Fuel. William M. MacKay. 2000 w. Am Soc Ht & Vt Engrs, JI—Jan., 1918. Ways and means of conserving the coal supply.

Coal Mining in the United Kingdom Under War Conditions (82480). J. B. C. Kershaw. 2500 w. Cl Age—Nov. 17, 1917. Steps taken in England to minimize the difficulties arising from fuel shortage.

National Fuel Research (82678). 2700 w. Times Engng Supp—Oct. 26, 1917. Report of Fuel Research Board in Great Britain.

Address on the Fuel Problem in the United States (82465 D). F. C. Honnold, with discussion. 8 pp. Am Soc Ht & Vt Engrs, JI—Oct., 1917. The coal situation.

Fuel Research (82282 A). 2500 w. Elec'n—Oct. 19, 1917. Abstract of second report of the Fuel Research Board.

A Revolutionizing Coal Discovery Announced from New York (84152). 2000 w. Mfrs Rec—Feb. 7, 1918. Concerning a new process for treating bituminous coal, so that for fuel purposes it becomes equivalent to anthracite.

The Fuel Administration—Its Task (83254). H. A. Garfield. 3500 w. Cl Age—Dec. 29, 1917. What the fuel administration is organized to do.

Canada's Fuel Problem (84687). Joseph E. Armstrong. 3500 w. Can Engr—Feb. 28, 1918. Address in the Ontario House of Commons. Information concerning deposits of coal in Canada.

The Missouri Fuel Situation (84886). Wallace Crossley, with discussion. 4000 w. St L Ry Cb, Pro—Feb. 15, 1918. Need of co-ordination.

Fuel Conservation

Bonus System for the Saving of Coal (83480). Walter N. Polakov. 3000 w. Elec Wld—Jan. 5, 1918. Task-setting plan results in improved economy.

Fuel Conservation (83926). 2600 w. Times Engng Supp—Nov. 30, 1917. Abstract of paper by J. B. C. Kershaw be-

Fuel Economy

fore Liverpool Engng Soc. Use of low-grade fuels, such as coke-breeze, culm, etc.

Methods Employed to Aid Fuel Conservation (86353). 2500 w. Ry Rev—May 18, 1918. Abstracts of papers before the Pacific Ry. Club in San Francisco. Methods now in use for saving fuel oil; educating men, systematized effort and team work.

Fuel Economy

Work of the New Orleans Fuel Administration Committee (83830). Leo S. Weil. 2000 w. Power—Jan. 29, 1918. Work to conserve the coal supply.

The New Haven Saves a Million Dollars in Fuel (83817). From a report by George W. Wilden. 1800 w. Ry Age—Jan. 25, 1918. Marked economies effected by supervision of locomotives.

Fuel Order

New Coal and Lighting Order (87769 A). 8500 w. Colly Gdn—July 5, 1918. The "Household Fuel and Lighting Order, 1918," applying to England and Wales, restricting the consumption of coal, gas and electricity for domestic purposes.

Fuel Resources

Methods for More Efficiently Utilizing Our Fuel Resources (87448 A). E. B. Elliott. Map & Ills. 2500 w. Gen Elec Rev—July, 1918. Aims to show that the production of coke by the bee-hive oven is wasteful and that the by-product oven process is efficient.

Fuels

An Investigation of the Fuel Problem in the Middle West (86190 A). A. A. Potter. (Abstract.) 3000 w. A S M E, JI—May, 1918. Need of more adequate storage, greater fuel economy, and more careful regulation of quality to avert emergencies.

Fuel Economics (86277 N). D. B. Dowling. 4000 w. Can Min Inst, Bul—May, 1918. Fuel reserves, waste, etc.

Pulverized Coal for Industrial Purposes (86542). John Cutcliffe. Read before Vancouver Cham. Mines. 4500 w. Cl Age—May 25, 1918. Shows that it offers advantages over other fuels.

Fuel-Saving

Vigorous Fuel-Saving Campaign (87062). 2000 w. Elec Wld—June 22, 1918. Critical conditions of coal supply for next winter led to organized plans for economy in New England.

Fuel Shortage

Several Phases of the Fuel Shortage (84639). George F. Weaton. 1800 w. Natl Engr—March, 1918. Getting along with fuel shortage in industrial plants.

COAL AND COKE**Fuel Storage**

Preparing for Future Demands (85612). Ills. 1500 w. Pwr Pt Eng—April 15, 1918. A mammoth submerged coal shortage pit.

France

The Coal Problem in France (82,826 A). 1500 w. Colly Gdn—Nov. 9, 1917. Information from an article by R. Pinot showing the shortage in coal production.

Gaseous Mines

Outbursts of Gas in Crowsnest Field (88639). James Ashworth. Abstract of pamphlet relating to this coalfield of British Columbia. Ills. 3500 w. Cl Age—Sept. 5, 1918. Describes violent gas outbursts which, with other causes, have closed the mines.

Instantaneous Outburst of Coal and Gas at Bedford Collieries, Leigh (88373 N). F. N. Siddall, with discussion. Ills. 10 pp. Instn Min Engrs, Trans—July, 1918. Explains plan of working.

Gas Tar

Increasing Gas Tar Production (82674). 2000 w. Times Engng Supp—Oct. 26, 1917. A revised policy and suggestions offered for increasing output.

Gatehouse

Efficient Coal-Mine Gatehouse (84210). R. M. Magraw. Ills. 1000 w. Cl Age—Feb. 9, 1918. Describes a check cabin and features of checking system.

Germany

Mineral Wealth of Germany (89060 A). H. Louis. 1400 w. Nature—July 4, 1918. Abstract of article in June, 1918, issue of *Fortnightly Review* on coal and iron.

Germany's Coal Industry During the War (86389 A). 2200 w. Ir & Cl Trds Rev—April 12, 1918. Reviews the industry up to Oct., 1916, when the censor stopped publication of statistics.

Glass

Notes on a Gas-Coke-Producer-Fired Glass Tank Furnace for the Production of White Glass (86375 A). A. B. Roxburgh. Ills. 1500 w. Engng—May 3, 1918. Detailed description.

Gravity Tracks

Gravity Track System at Anthracite Coal Breakers (86443). F. N. Rupprecht. Ills. 2500 w. Eng News-Rec—May 23, 1918. Advantages and disadvantages of five typical layouts.

Illinois

Southern Illinois in 1917 (83715). E. J. Wallace. 3000 w. Cl Age—Jan. 19, 1918. In spite of many labor troubles the year was prosperous.

India

Coal Mining in India in 1916 (82549 A). 2000 w. Colly Gdn—Nov. 2, 1917.

India

Inert Matter

Information from the recent report of G. F. Adams, Inspector of Mines in India.

Inert Matter

Inert Matter in Coal (85881). 2000 w. Times Engng Supp—Mar. 29, 1918. Ash and waste matter. A hindrance to gas-making. Stack fires.

Instruments

Some Useful Instruments for Colliery Power Plants (87083 N). H. W. Ravenshaw, with discussion. Ills. 17 pp. Instn Min Engrs, Trans—May, 1918. Describes instruments not widely known.

Lignite

L'Industrie Du Lignite (82667 B). L. Renié. Ills. 4000 w. La Nature—Nov. 3, 1917. Lignite in France and its use in briquettes. Distillation products, etc. Lignite—Fuel Saver (88612). H. S. Cooper. 1800 w. Mfrs Rec—Sept. 5, 1918. The advantages and disadvantages, its qualities, applications, economical combustion, etc.

Lignites

Combustion of North Dakota Lignites With Suggestions for Design of Furnaces (85970). Henry Kreisinger. Ills. 3000 w. Power—Apr. 30, 1918. Results of investigations in the use of lignites.

Carbonizing and Briquetting of Lignites (83959 N). W. J. Dick. 20 pp. Com. of Conservation, Canada—1917. The economic possibilities.

Longwall

Coal Mining and Man Power (88327). F. A. Pocock. 1500 w. Cl Age—Aug. 22, 1918. Argues that longwall method would increase output of bituminous.

Longwall Mining at La Salle, Illinois (88473). George W. Harris. Map & Ills. 4000 w. Cl Age—Aug. 29, 1918. Method described.

Low Grade Fuels

Les Mauvais Combustibles (85114 B). L. Renié. Ills. 2700 w. La Nature—Jan. 26, 1918. Treatment of inferior grades of fuel. Coal washing systems.

Lynn System

Lynn By-Product Producer-Gas Plant and the Utilization of Low-Grade Fuels (86401 A). Ills. 2200 w. Ir & Cl Trds Rev—Mar. 8, 1918. Details of the plant at the Fushun mines in Manchuria.

Marcus Screen

Marcus Screen at Plants of the Carnegie Coal Co., Pennsylvania (87856). Richard G. Miller. Ills. 2500 w. Cl Age—July 25, 1918. The combined

COAL AND COKE**Mining Control**

screen and picking table has proved its value in the preparation of coal.

Mechanical Mining

Mechanical Mining Without Explosives (85622). N. D. Levin. Ills. 1800 w. Cl Age—April 13, 1918. Account of a machine that cuts, breaks down and loads coal.

Methods

Coal Conveyor in a Thin Bed (82-752). D. C. Ashmead. Ills. 1500 w. Cl Age—Dec. 1, 1917. Longwall method adapted, using face conveyors.

A Plea for the Examination of Methods and for Greater Efficiency (84849 A). Robert Wilson. Read before Natl. Assn. of Colly. Mgrs. 4500 w. Ir & Cl Trds Rev—Feb. 22, 1918. Points deserving attention in coal mining.

Middle West

Market Conditions in Middle West in 1917 (83718). O. M. Burnett. 3000 w. Cl Age—Jan. 19, 1918. Continuous coal shortage; labor troubles; inadequate transportation, etc.

Mine Cave

Anthracite Mine-Cave Situation (89125). 4000 w. Cl Age—Sept. 26, 1918. The solution of the Scranton mine-cave problem. Methods proposed and adopted.

Mine Control

The Future Control of Coal Mines (86224 A). G. H. D. Cole, with discussion. 4000 w. Colly Gdn—Apr. 26, 1918. Addresses at Newcastle favoring control by trade union.

Mine Engineering

Efficiency Engineering for Coal Mines (83567). C. H. Elsom. 3500 w. Cl Age—Jan. 12, 1918. Value of specialization in engineering.

Mine Roofs

Some Notes on Roof Conditions at the Lethbridge Colliery (86906 N). J. B. De Hart. Ills. 1200 w. Can Min Inst, Bul—June, 1918. Explains behavior of the roof.

Mine Power

An Up-to-Date Coal Mine Power Plant (83566). Dever C. Ashmead. Ills. 2000 w. Cl Age—Jan. 12, 1918. Serial, 1st part. Details of construction of a new plant at Clymer, Penn.

Mine Supplies

Handling Material and Supplies at Coal Mines (86082). R. M. Magraw. Ills. 2500 w. Cl Age—May 4, 1918. Describes a centralized material storage where accounts are kept of everything.

Mining Control

Coal Mines Control Agreement (82547 A). 5500 w. Colly Gdn—Nov.

Mine Inspection

2, 1917. Text of the Compensation Bill introduced in the House of Commons on Oct. 25, with the Agreement to which the Bill is to give effect.

Mine Inspection

Coal Mines Inspection in 1917 (88605 A). 9000 w. Colly Gdn—Aug. 16, 1918. Reports from various divisions of Great Britain and Ireland.

Mining Institute

Coal Mining Institute of America Meets (82992). R. Dawson Hall. 1800 w. Cl Age—Dec. 15, 1917. Serial, 1st part. First instalment of an account of important features of the meeting.

Mining Methods

Coal Mining in Carbonado, Washington (88238). F. G. Jarrett. Ills. 3000 w. Cl Age—Aug. 15, 1918. Longwall worked on a steeply pitching bed. Other difficulties.

Methods of Operation (88239). J. F. K. Brown. 2500 w. Cl Age—Aug. 15, 1918. Considers factors influencing methods to be adopted in coal mining.

Scraper Mining of Thin Bed Anthracite (88240). E. P. Humphrey. Ills. 2500 w. Cl Age—Aug. 15, 1918. Describes method that has been reasonably successful.

The Working of Seams Having Frail Roofs (83768 A). John W. Case. Ills. 3000 w. Ir & Cl Trds Rev—Dec. 28, 1917. Timbering and best methods are discussed.

Moisture

The Moisture Content of Some Typical Coals (84891 B). G. A. Hulett, E. Mack, and C. P. Smyth. Ills. 2500 w. Am JI Sci—March, 1918. Detailed study of typical coals.

New South Wales

Recent Developments in the Coal Fields South of Sydney (89528 A). Dr. J. R. M. Robertson. Map and Ills. Read before Instn. of Min. Engrs. 4800 w. Colly Gdn—Sept. 27, 1918. Physiography of this coalfield.

Organization

Coal Company Organization (85945). W. W. Bedow. 2500 w. Cl Age—Apr. 27, 1918. Adoption of an efficiency system with good results.

Orient Mine

Orient Mine of Franklin County, Illinois (88326). George W. Harris. Ills. 3000 w. Cl Age—Aug. 22, 1918. Detailed description of mine and methods.

Outbursts

An Instantaneous Outburst of Coal and Gas (86774 A). F. N. Siddall. 2000 w. Colly Gdn—May 17, 1918. An account of an occurrence in Lancashire, and of similar outbursts.

COAL AND COKE**Ownership**

The Colliery Manager and State Ownership (87411 A). F. McAvoy. Read before Assn. of Colly. Mgrs. 3500 w. Ir & Cl Trds Rev—June 7, 1918. The control of the mining industry in the British Isles.

Oxidation

Effect of Low-Temperature Oxidation on the Hydrogen in Coal and the Change in Weights of Coal on Drying (82379). S. H. Katz and H. C. Porter. Ills. 2500 w. U S Bur Mines—Tech. paper 98. Investigations and results.

Peat

The Peat Deposits of Minnesota (82406 B). E. K. Soper. Ills. 15 pp. Ec Geol—Sept., 1917. Quantity, quality, and uses are outlined.

The Possibilities of Peat as Fuel (82521). John Olsen. 1500 w. Power—Nov. 20, 1917. Method of preparing, use, and cost.

Pillar Robbing

Importance of Proper Robbing Methods (84953). J. T. Morris. Ills. 1000 w. Cl Age—March 16, 1918. Importance of the question of pillars.

Pillars

Extracting Coal Pillars from Fiery Seams (87768 A). R. H. Husband. Ills. 4000 w. Colly Gdn—July 5, 1918. From paper before Min. & Geol. Inst. of India. Sources of danger, preventive measures, packing, etc.

The Extraction of Coal Pillars from "Fiery" Seams, and Goaf Stowing in Indian Mines (86945 N). R. H. Husband. Ills. 20 pp. Min & Geol Inst of India, Trans—Jan., 1918. Details of system recommended.

Pit Props

Ferro-Concrete Pit Props (82137 A). W. Marriott. Read before the Midland Co.'s Instn. of Engrs. 1200 w. Colly Gdn—Oct. 12, 1917. Information based on experiments.

Powdered Coal

A Diversified Application of Powdered Coal (88753 A). Charles Longnecker. Ills. 1300 w. Iron Age—Sept. 12, 1918. Distributed by compressed air to sub-stations and used in open-hearth, annealing and other furnaces.

The Possibilities of Powdered Coal as Shown by Its Combustion Characteristics (87248 A). W. G. Wilcox. 7000 w. Chem & Met Eng—July 1, 1918. Shown to be efficient and flexible in meeting various demands.

See Fuels under MECHANICAL ENGINEERING, *Steam Engineering*.

See same heading under MECHANICAL ENGINEERING, *Steam Engineering*.

Prices

COAL AND COKE

Russia

Powdered Coal for Power Plants (85491). Frederick Seymour. Ills. 2500 w. Elec Rev, Chi—April 6, 1918. Methods of overcoming difficulties.

See also Powdered Fuel, under MECHANICAL ENGINEERING, *Steam Engineering*.

Power Generation

Economical Generation of Thermal Power at Coal Mines (82751). John B. C. Kershaw. 3500 w. Cl Age—Dec. 1, 1917. Serial, 1st part. Deals with the waste fuels at mines and their utilization.

Prices

Graphic Determination of Prices (86541). J. D. Skinner. 600 w. Cl Age—May 25, 1918. Curves for determining the varying prices for different sizes of coal at the mine.

Maximum House Coal Prices in the Metropolitan Area (85260 A). 3500 w. Colly Gdn—March 1, 1918. Rules for determining prices.

Production

Increased Production in Wartime (89,257). R. M. Magraw. 2500 w. Cl Age—Oct. 3, 1918. Methods worthy of consideration for increasing coal production.

Can Output Be Increased Scientifically? (88329). W. E. Joyce. 1500 w. Cl Age—Aug. 22, 1918. Thinks modern science might be used to good effect.

Coal Production and Lubrication (87857). Reginald Trautschold. 2000 w. Cl Age—July 25, 1918. A plea for the use of semi-grease compounds for service in coal mines.

Activities in Different Coal-Producing States in 1917 (83711). 20 pp. Cl Age—Jan. 19, 1918. Coal-mine inspectors reports of the various states.

Pulverized Coal

Use of Pulverized Coal at the Bunker Hill and Sullivan Smelting and Refining Plant (87665 A). C. T. Rice. Ills. 1800 w. Eng & Min Jl—July 20, 1918. Methods adopted to pulverize coal for use in smelting and boiler works, and the control and distribution by the Holbeck system.

Excellent Results with Pulverized Coal at Milwaukee (89516). Ills. 2500 w. Power—Oct. 15, 1918. No slag or ash troubles, ease of control, and other beneficial results.

Experience with Pulverized Coal (89,613). 2000 w. Elec Wld—Oct. 19, 1918. How difficulties were overcome in the plant of a Milwaukee utility company.

Notable Stationary Installation of Pulverized Coal (89426). Ills. 2000 w. Ry Age—Oct. 11, 1918. From paper by John

Anderson, describing the equipment at the Oneida St. Station, Milwaukee.

Pulverized-Coal Tests Conducted at Milwaukee—I (89631). 1000 w. Elec Rev, Chi—Oct. 19, 1918. Serial, 1st part. Details of installation of the Milwaukee Electric Ry & Lgt Co's plant at Oneida St.

Pulverized Fuel in a Milwaukee Power Plant (89682). John Anderson. Ills. 1500 w. Ry Rev—Oct. 26, 1918. Results.

Utilization of Pulverized Coal (84001). H. G. Barnhurst. 3000 w. Pwr Pt Eng—Feb. 1, 1918. Methods of preparing and handling.

General Utilization of Pulverized Coal (83226 B). Henry G. Barnhurst, with discussion. 19 pp. Cleve Eng Soc, Jl—Nov., 1917. Facts concerning the growth and development of the use.

General Utilization of Pulverized Coal (82956 A). H. G. Barnhurst. Ills. 2000 w. E Cb Phila, Jl—Dec., 1917. Development and industrial applications.

Use of Pulverized Coal in Brazil (82400 A). Ills. 1000 w. Ry Mech Engr—Nov., 1917. Method has made available quantities of Brazilian fuel for railroad purposes.

Pulverized Coal for Industrial Purposes (87903 A). J. Cunliffe. 2000 w. Colly Gdn—July 12, 1918. Preparation, application, and burning.

Quality

Limiting the Impurities in Coal (86841 A). 4000 w. Iron Age—June 13, 1918. Discussions at meeting of A. S. M. E. at Worcester, Mass. Government plans to govern quality and curtail supply.

Queensland

Coal Near Wondai (87492 N). Lionel C. Ball. Ills. 2500 w. Qnsd Gov Min Jl—May, 1918. With notes on a discovery of cobalt in the Burnett district; geological features and description of coal.

Rates

British and Foreign Coal Rates (84,663 A). Granville F. Bilbrough. 6000 w. Ir & Cl Trds Rev—Feb. 8, 1908. Serial, 1st part. Comparison and discussion of rates in different countries.

Roof Supports

Supporting the Roof in Coal Mines (84453). R. D. Brown. Ills. 3000 w. Cl Age—Feb. 23, 1918. Serial, 1st part. Present article considers temporary and permanent wood supports.

Russia

See same heading under Iron and Steel.

Consult Classification of the Index. See page 9.

COAL AND COKE

Sulphur

Safety Lamps

Lighting Safety Lamps by Electrical Ignition (83748 A). L. Fokes. Ills. 2500 w. Colly Gdn—Dec. 21, 1917. Details of accumulators and sparking coil method, and of the magneto-generator lighters.

Sampling

The Commercial Sampling and Analysis of Coal, Coke, and By-Products (87490 N). Ills. 1300 w. Chem Eng & Min Rev—May, 1918. Comments on methods of the U. S. Steel Corporation.

See also Powdered Fuel, under MECHANICAL ENGINEERING, *Steam Engineering*.

Directions for Sampling Coal for Shipment or Delivery (83647). George S. Pope. Ills. 10 pp. U S Bur Mines—Tech paper 133. Instructions regarding hand methods of sampling in the field.

Screens

A New Type of Screen (89123). M. Raymond. Ills. 1200 w. Cl Age—Sept. 26, 1918. A modified form of the American system of rope transmission which may be used for coal screening.

Separation

A New Method of Separating Slate from Coal (88126 A). H. M. Chance, with discussion. Ills. 7500 w. E Cb Phila, J1—Aug., 1918. Describes a new gravimetric method, which depends on the differences in the specific gravity.

Signaling

Block Signal System for Coal Mines (83568). Frank Huskinson. Ills. 2000 w. Cl Age—Jan. 12, 1918. Details of the automatic system and its advantages.

Slack

Burning Slack Containing Excessive Moisture (85371). J. F. McCall. Ills. 900 w. Power—April 2, 1918. Successful experiments.

Small Coal

A System of Storing and Filling Small Coal, with Remarks Upon the Prevention of Spontaneous Heating in Coal-Heaps (85720 N). John Morison, with discussion. Ills. 11 pp. Instn Min Engrs, Trans—March, 1918. Gives results of experience.

Soft Coal

See same heading under MECHANICAL ENGINEERING, *Heating and Cooling*.

Spontaneous Combustion

The Flow of Air Through Small Coal and Other Broken Material: Report to the Doncaster Coal Owners' Committee (88884 N). John T. Storrow, with dis-

cussion. Ills. 10 pp. Instn Min Engrs, Trans—Aug.-Sept., 1918. Investigations and results.

Heating of Coal in Piles (84339 D). C. M. Young. 600 w. A I M E, Bul—Feb., 1918. Investigation of ways of preventing heating in storing coal.

Spontaneous Ignition

Coal Stack Fire Risks (83739 A). E. B. Pausey. 3000 w. Elec Rev—Dec. 28, 1917. Dangers from spontaneous ignition, the causes, and means of storing coal with a minimum of danger.

Spontaneous Heating of Slack Heaps (85785 A). George Knox. From J1. of Monmouthshire Colliery Off. Assn. 2200 w. Colly Gdn—April 5, 1918. Cause of heating, treatment and prevention.

Spontaneous Ignition of Bituminous Coal (85660). J. F. Springer. Ills. 3000 w. Power—April 16, 1918. Explains how it occurs, and gives results of experiments made to determine conditions favorable and unfavorable, and methods of storing coal to prevent such action.

Steam Turbines

The Steam Turbine as Applied to Colliery Work (86377 A). P. J. Plevin. 2500 w. Ir & Cl Trd Rev—Mar. 1, 1918. Read before Assn. of Min. Elec. Engrs. Deals with effects of changes resulting from war conditions. Advantages of prime movers of different types under present conditions.

Stone Dusting

Stone Dusting in Mines (86773 A). A. Rushton. 1200 w. Colly Gdn—May 17, 1918. Describes a sprayer and its operation, which gives a better deposit and better mixing.

Storage

The Safe Storage of Coal (86832 A). W. D. Langtry and J. F. Kohout, in *The Black Diamond*. 2500 w. Colly Gdn—May 24, 1918. Precautions when storing in open piles.

Anthracite and Bituminous Coal Storage (83475). Horace Goldstein. Ills. 2000 w. Cl Age—Jan. 5, 1918. Tells how and where to stock the two kinds of fuel.

Stripping

Anthracite Coal Stripping (83253). Thomas F. Kennedy. 1300 w. Cl Age—Dec. 29, 1917. Serial, 1st part. Method of prospecting a stripping area.

Economy of Mining Coal by Stripping (83142). E. C. Drum. Ills. 1000 w. Cl Age—Dec. 22, 1917. Methods and costs.

Sulphur

Recovery of Sulphur from Illinois Coals (82431 A). Joseph E. Pogue. 1500 w. Met & Chem Eng—Nov. 15,

Superheat

1917. Source of increased supply of sulphur.

Recovering Sulphur from Coal (82136 A). From an article by A. Sander, in Chem. Zeit. 2000 w. Colly Gdn—Oct. 12, 1917. Diagram and details of the Feld process.

Superheat

The Value of Superheated Steam at the Colliery and at Ironworks (89101 A). Ills. 1200 w. Ir & Cl Trds Rev—Aug. 30, 1918. Explains advantages and gives details of the "Sugden" superheater.

Supply

Coal Shortage (88872 N). F. W. Gray. 2000 w. Can Min Inst, Bul—Sept., 1918. The urgency of increased production and its importance in winning the war.

Switzerland

The Coal and Electricity Question in Switzerland (84024 A). 1700 w. Engr—Jan. 11, 1918. Explains the serious situation due to German influence.

Testing

Some Notes on Coal Testing (83742 A). G. W. Stubbings. 2000 w. Elec Rev—Jan. 4, 1918. Directions for sampling and determining the calorific value.

Thawing

Dry Process of Thawing Coal (84452). Ills. 1100 w. Cl Age—Feb. 23, 1918. The car is placed in a building in which hot air is circulated.

Thawing Coal

A Modern Plant for Thawing Coal in Cars (85334). Scott W. Linn. Ills. 1200 w. Ry Age—March 20, 1918. A building of precast unit concrete construction.

Thin Beds

Working Thin Beds by Longwall (85493). Rowland Gascoyne. 3000 w. Cl Age—April 6, 1918. Most economical system to follow in beds less than 2 ft. 6 in. in thickness.

Thin Seams

Discussion of Mr. George Gibb's Paper on "A Fresh Aspect of Intensive Mining Thin Seams" (84938 N). 1300 w. Instn Min Engrs, Trans—Jan., 1918.

The Thin Coal Seams of Eastern Canada (84661 A). Ills. 3000 w. Engng—Feb. 8, 1918. Reviews monograph by I. F. Kellock Brown, issued by the Can. Dept. of Mines.

The Thin Seam Problem (82138 A). H. O. Dixon. Read before Manchester Geol. & Min. Soc. 1500 w. Colly Gdn—Oct. 12, 1917. Methods of cooking and results from a 19-in. seam of steam coal.

The Thin-Mine Problem (83117 N). H. O. Dixon, with discussion. 2500 w. Instn Min Engrs, Trans—Nov., 1917.

COAL AND COKE

Methods of working and results from a 19-inch seam of steam coal.

Tipples

Shipping Facilities at the World's Largest Coal Mine (89122). R. W. Mayer. 2500 w. Cl Age—Sept. 26, 1918. Arrangements at Vesta No. 4 mine near California, Pa., for loading coal barges.

Valley Camp Coal Co.'s Tipple at Parnassus, Penn. (89121). George S. Jaxon. Ills. 2000 w. Cl Age—Sept. 26, 1918. Tipple designed to make four sizes of coal.

United States

Coals of the United States (86357). 2000 w. Power—May 21, 1918. Serial, 1st part. Gives proximate analyses of typical coals of the U. S., to be followed by articles on fuels and types of stokers and furnaces best adapted to them.

Unloading

American Methods of Unloading Coal from Car and Barge (86831 A). Ills. 4500 w. Colly Gdn—May 24, 1918. Arrangements for the receipt of coal from the railroad or ship.

Utah

Coal Mining in Utah in 1917 (83820). A. C. Watts. Ills. 6000 w. Cl Age—Jan. 26, 1918. Reviews this industry for the year.

Vancouver

Coal Industry of Vancouver Island (86083). Robert Dunn. 1800 w. Cl Age—May 4, 1918. In flourishing condition. Development in progress.

Washery

New Steel Washery of the Locustdale Coal Company (86540). Wilbur L. Cross. Ills. 2500 w. Cl Age—May 25, 1918. Rapid erection work at Germantown, Pa.

Washing

Coal Washing (84141 A). T. J. Drakeley. From paper before Manchester Geol. & Min. Soc. 8500 w. Colly Gdn—Jan. 18, 1918. Theory and practice, efficiency, and general conclusions.

Waste

Waste Due to Excessive Ash in Coal (89472). 1800 w. Cl Age—Oct. 10, 1918. A report made by the J. G. White Eng. Corp. on clean coal and the effect of high ash upon thermal efficiency, amount of boiler plant, etc.

Waste

Waste in Coal in Canada (86297 N). W. J. Dick, with discussion. 28 pp. Can Min Inst, Bul—May, 1918. The value and waste of coal.

Winding Plant

Notes on the Overhead Koepe Winding Plant at Plenneller Colliery, Haltwhistle, Northumberland (88371 N). George Raw. Ills. 18 pp. Instn Min

Alum

Engrs, Trans—July, 1918. Description of plant and report of experience gained. Electric Winding Engines and Mine Hoists (87914 A). H. H. Broughton.

GEOLOGY

Goldfields

3500 w. Elec'n—July 5, 1918. Serial, 1st part. The present article defines the scope of the work and gives notes on the question of power supply.

GEOLOGY

Alum

On the Occurrence of Natural Alum, etc., at Boonmoo Pinnacle, North Queensland (85227 N). E. Cecil Saint-Smith. Ills. 1000 w. Qnsd Gov Min J1—Feb. 15, 1918. Of no commercial importance.

Antarctic

Antarctic Geology (83834 A). Griffith Taylor. Map & Ills. 5500 w. Min Mag—Dec., 1917. Describes geology of part of South Victoria Land and gives information relating to coal deposits.

Apexes

Apexes and Anticlines (87536). Robert M. Searls. Ills. 1700 w. Min & Sci Pr—July 13, 1918. Decision of the U. S. Supreme Court in the case of Jim Butler Tonopah Mining Co. v. West End Consolidated Mining Co.

Applied Geology

Engineering Applications of Geology (82902). W. J. Dick. Ills. 3000 w. Can Engr—Dec. 6, 1917. Foundation conditions in Canadian cities. Interpretation of geological data with reference to engineering. Read before Can. Soc. C. E.

Arizona

The Jerome District of Arizona (89-178 A). J. R. Finlay. Ills. 6500 w. Eng & Min J1—Sept. 28, 1918. Serial, 1st part. Broader phases of the geology of this district are discussed.

Arsenic

Notes on the Geology of Jibbenbar and the State Arsenic Mine (86034 N). H. J. Jensen. Ills. & Maps. 3000 w. Qnsd Gov Min J1—Mar. 15, 1918. Location, physiography, geology, lodes, present prospecting operations.

Australia

Recent Earth Tremors in Western Australia (88141 N). A. Montgomery. Abstract of report to Minister of Mines. 2500 w. Chem Eng & Min Rev—July, 1918. Interaction of geological causes and mining operations.

British Columbia

Gneissic Galena Ore from the Slocan District, British Columbia (84330 B). W. L. Uglow. Ills. 4500 w. Ec-Geol—Dec., 1917. General geology; the ore bodies, their occurrence, structure, origin, etc.

The Copper Silver Veins of the Telkwa District, British Columbia

(88312 B). V. Dolmage. Ills. 32 pp. Ec Geol—July, 1918. Summary of results of an investigation of the geology and mineral deposits of this district.

Coal

Coal—Its Origin and Composition (84-303). H. B. Miller. 2200 w. Cl Age—Feb. 16, 1918. Accepted theories of geologists and related information.

Coal Seams

Preliminary Note on the Burning of Coal Seams at the Outcrop (86946 N). L. Leigh Fermor, with discussion. 13 pp. Min & Geol Inst of India, Trans—Jan., 1918. A study distinguishing between burning of coal seams at the outcrop, and the coking of coal seams in depth caused by intrusions of mica-peridotite.

Colorado

The Whitepine Section of the Tomichi District (88355 A). James E. Dick. Ills. 2000 w. Eng & Min J1—Aug. 24, 1918. Geological and mining conditions. Ores developed show lead, zinc, copper and silver sulphide containing some gold.

Diamonds

The Formation of Diamond (86371 A). Charles A. Parsons. Ills. 5000 w. Engng—May 3, 1918. Lecture before the Inst. of Metals, May 2, 1918.

The Formation of Diamond (86715 A). Charles Parsons. 2800 w. Engr—May 3, 1918. Serial, 1st part. May lecture at the Inst. of Metals. Reviews researches and investigations to account for the origin.

Earth Structure

The Growth of Knowledge of Earth Structure (87603 D). Joseph Barrell. 38 pp. Am J1 Sci—July, 1918. Synopsis of progress made during the last century.

Geological Surveys

A Century of Government Geological Surveys (87604 D). George Otis Smith. 22 pp. Am J1 Sci—July, 1918. Reviews the history of the work accomplished.

Goldfields

The South Rand Goldfield—Part II (83114 N). A. R. Sawyer, with discussion. 4000 w. Instn Min Engrs, Trans—Nov., 1917. Information concerning this field, its stratification, etc.

GEOLOGY

Molybdenite

Gold and Silver

Geologische arbeidsmethoden voor de opsporing van delstofsafzettingen (89051 B). E. C. Abendanon. 3200 w. Ingenieur—July 6, 1918. Geological methods of prospecting for gold and silver.

Historical Geology

A Century of Geology.—The Progress of Historical Geology in North America (87601 D). Charles Schuchert. 69 pp. Am J Sci—July, 1918. Synopsis of the more important steps in the progress from 1818 to 1918.

Idaho

An Old Erosion Surface in Idaho: Is It Eocene? (85057 B). John L. Rich. Sketch map. 16 pp. Econ Geol—March, 1918. Examination to determine the age.

Iron Deposits

The Iron-Formation on Belcher Islands, Hudson Bay, with Special Reference to Its Origin and Its Associated Algal Limestones (88171 C). E. S. Moore. Ills. 26 pp. JI Geol—July-Aug., 1918. Topography, geology, etc.

Ironstones

The Jurassic Ironstones of the United Kingdom — Economically Considered (87381 N). F. H. Hatch. Ills. 45 pp. Ir & St Inst—May, 1918. Particulars regarding their distribution, composition, and output.

Korea

Geology and Ore Deposits of the Collbran Contact of the Suan Mining Concession, Korea (84480 B). D. F. Higgins. Ills. 34 pp. Ec-Geol—Jan., 1918. Phenomena associated with intrusion, metamorphism and ore deposition.

Land Forms

A Century of Geology—Steps of Progress in the Interpretation of Land Forms (87602 D). Herbert E. Gregory, with bibliography. 29 pp. Am JI Sci—July, 1918. Traces the fluctuation in the development of fact and theory as related to valleys and glacial features.

London Basin

The Palaeozoic Platform Beneath the London Basin and Adjoining Areas, and the Disposition of the Mesozoic Strata Upon it (87904 A). Herbert Arthur Baker. Maps. 3000 w. Ir & CI Trds Rev—July 12, 1918. Serial, 1st part. Geological problems of interest.

Magnetites

Some Features of Magnetic Surveys of the Magnetite Deposits of the Duluth Gabbro (84481 B). T. M. Broderick. Maps & Ills. 14 pp. Ec-Geol—Jan., 1918. Outlines methods used and some results obtained.

The Relation of the Titaniferous Mag-

netites of Northeastern Minnesota to the Duluth Gabbro (84331 B). T. M. Broderick. Ills. 34 pp. Ec-Geol—Dec., 1917. Types of magnetic ore within the gabbro and their origin.

Magnesite

Notes on the Possible Origin of the Magnesite near Valley, Washington (88313 B). Olaf P. Jenkins. Ills. 800 w. Ec Geol—July, 1918. Describes the deposits and suggests their origin.

Manchester, Eng.

The Geology of Manchester as Revealed by Borings (86315 N). George Hickling, with bibliography and discussion. 2 Plates. 60 pp. Instn Min Engrs, Trans—April, 1918. Information from the investigation of the geology of the Lancashire Coalfield, dealing mainly with provings of strata in sinking boreholes to water bearing strata for supplying water for industries.

Manchuria

Coal and Iron Deposits of the Pen-hsi-hu District, Manchuria (84341 D). C. F. Wang. Ills. 28 pp. A I M E, Bul—Feb., 1918. Describes the district, geology, deposits, development, etc.

Mesabi Range

Recent Geologic Developments on the Mesabic Iron Range Minnesota (84431 N). J. F. Wolff. Ills. 29 pp. L. S. Min Inst, Pro—1917. Sub-divisions of the iron formation, with discussion of the relations of the ore-bodies to the folding and fracturing.

Mineragraphy

Notes on the Technique of Mineragraphy (84332 B). W. L. Whitehead. Ills. 20 pp. Ec-Geol—Dec., 1917. Experience in the preparation and study of polished section of ores.

Mineralogy

The Growth of Mineralogy From 1818 to 1918 (87605 D). William E. Ford. 15 pp. Am JI Sci—July, 1918. Review of progress.

Mineral Resources

The Constitution and Work of the Imperial Institute, With Special Reference to Mineral Resources (85037 N). 19 pp. Imp Inst, Bul—July-Sept., 1917. Investigations.

Molybdenite

A Pegmatitic Origin for Molybdenite Ores (86869 B). E. Thomson. Ills. 11 pp. Ec Geol—June, 1918. Investigations of molybdenite properties in Quebec and Ontario. See pp. 316, 331.

Molybdenite Operations at Climax, Colorado (88108 D). D. F. Haley. 5 pp. A I M E, Bul—Aug., 1918. Geology of the deposit, mining system, milling plant and practice, etc.

GEOLOGY

Phosphate

Nickel

Some Quantitative Measurements of Minerals of the Nickel-Eruptive at Sudbury (83046 B). Myron A. Dresser. Ills. 17 pp. Ec-Geol—Oct.-Nov., 1917. Study and conclusions.

Nitrates

Origin of Nitrates in Cliffs and Ledges (82350). Hoyt S. Gale. Ills. 2000 w. Min & Sci Pr—Nov. 10, 1917. Deposits formed on Cliffs as well as in soils; meteorological influences, etc.

Oil Fields

Geology of the Oil Fields of North Central Texas (86913 D). Dorsey Hager. Ills. 10 pp. A I M E, Bul—June, 1918. Describes the general geology, and gives statements as to probable prospective pools.

Oil Geology

The Movements of Oil and Gas Through Rocks (88311 B). Victor Ziegler. 13 pp. Ec Geol—July, 1918. Views as to the causes of migration.

Oil-Shale

Oil-Shale in the United States (82404 B). Dean E. Winchester. Ills. 13 pp. Ec Geol—Sept., 1917. The formations, origin, their development, processes, results, etc.

Oklahoma

Geologic Structure in the Cushing Oil and Gas Field, Oklahoma (83640 N). Carl H. Beal. Ills. & Maps. 55 pp. U S Geol Surv—Bul 658. Aims at preventing economic waste in the production of oil.

Oklahoma Oil

Age of the Oil in Southern Oklahoma Fields (82504 D). Sidney Powers. Maps. 12 pp. A I M E, Bul—Nov., 1917. Geological history and study, with conclusions.

Ontario

Onaping Map-Area (86806 N). W. H. Collins. Maps & Ills. 147 pp. Can Dept Mines—Geol Surv, Mem 95. General character of the area, the geology, ore deposits, properties developed, etc. Espanola District, Ontario (84165 N). Terence T. Quirke. Ills. & Maps. 85 pp. Can Dept Mines—Mem. 102. Account of the geology.

Ore Deposits

The Geology and Ore Deposits of Ely, Nevada (87173). Abstract of paper by Arthur C. Spencer. 3000 w. Min & Sci Pr—June 22, 1918. Description and origin of copper ore and other deposits.

Pressure in the Formation of Ore Deposits (83880). Stephen Taber. Ills. 2500 w. Min & Sci Pr—Jan. 26, 1918. Crystal pressure in forming vein-space in deposition of minerals.

Manganiferous Iron Ore Occurrences

(83283). Joseph B. Umpleby. 1000 w. Eng & Min JI—Dec. 29, 1917. Two deposits in Colorado recently developed.

Further Remarks on the Ores of Engels, California (85053 B). L. C. Graton and D. H. McLaughlin. 18 pp. Econ Geol—March, 1918. Study of secondary enrichment.

Notes on Certain Ore Deposits of the Southwest (89574 D). W. Tovote. 5000 w. A I M E, Bul—Oct., 1918. Information based on 12 years' experience in the Southwest.

Preliminary Note on the Occurrence of Chalmersite, Cu Fe₂ S₃ in the Ore Deposits of Prince William Sound, Alaska (82405 B). Bertrand L. Johnson. 1500 w. Ec Geol—Sept., 1917. Physical and chemical properties, distribution, geologic occurrence, etc.

Ore Deposits of the Yellow Pine Mining District, Clark County, Nevada (84360 D). Fred A. Hale, Jr. Map & Ills. 18 pp. A I M E, Bul—Feb., 1918. Describes the most prominent geologic features, with special reference to those of economic importance. Oxidized lead-zinc deposits, copper-gold, with platinum metals; also silver.

The Evolution of Ore Deposits from Igneous Magmas (84188 A). W. H. Goodchild. 7500 w. Min Mag—Jan., 1918. Serial, 1st part. Principles governing the segregation of ore deposits from rock magmas.

Ores

The Relation of Sphalerite to Other Sulphides in Ores (82501 D). L. P. Teas. Ills. 15 pp. A I M E, Bul—Nov., 1917. Investigations and results.

Origin of Ores

Some Chemical Experiments Bearing on the Origin of Certain Uranium-Vanadium Ores (84482 B). Frank B. Notestein. 14 pp. Ec-Geol—Jan., 1918. Investigations of certain natural solvents and precipitants of vanadium and uranium.

Petroleum

The Geology of Petroleum Deposits (85045 A). C. C. O'Harra. Maps and Ills. 20 pp. Pahasapa Qr—Feb., 1918. Theories and studies of oil and gas deposits.

Petroleum Geology

Superficial Dip of Marine Limestone Strata. A Factor in Petroleum Geology (86262 B). Kirtley F. Mather. Ills. 2500 w. Ec Geol—May, 1918. Factors of importance to petroleum geologists.

Phosphate

Phosphate in Egypt (84358 D). E. Cortese. Map. 1500 w. A I M E, Bul—Feb., 1918. Principal features of beds examined.

IRON AND STEEL

Alloys

Potash

Geology of the Glass House Mountains and of Potash Salts (83231 N). H. I. Jensen. Ills. 1200 w. Qnsd Gov Min J1—Nov. 15, 1917. Potash from trachytic rocks of Queensland.

Pyrite

Pyrite Deposits of Leadville, Colo. (88,200 D). Howard S. Lee. 5 pp. A I M E, Bul—Aug., 1918. Geology and ore occurrence, method of mining, etc.

Quebec

Contributions to the Mineralogy of Black Lake Area, Quebec (86808 N). Eugene Poitevin and R. P. D. Graham. Ills. 103 pp. Can Dept Mines, Museum Bul, No. 27—Feb. 28, 1918. Geology, minerals, their mode and origin, etc.

Timiskaming County, Quebec (86807 N). M. E. Wilson. Maps & Ills. 187 pp. Can Dept Mines—Geol Surv, Mem. 103. Results of several years of geological work in northwest Quebec. General description, physiography, etc.

Queensland

Geological Notes on the Kin Kin (85228 N). Lionel C. Ball. Ills. 3000 w. Qnsd Gov Min J1—Feb., 1918. General geology.

Notes on the Geology of Parts of Gladstone District (84695 N). H. I. Jensen. Maps. 2500 w. Qnsd Gov Min J1—Jan., 1918. Observations on the geology and ore deposits.

Refractories

Geological Research on Refractories During 1916 (82816 A). A. Strahan. 5000 w. Colly Gdn—Nov. 16, 1917. Summary of progress of the field work of the Geological Survey.

Salt Domes

Origin of the Texas Domes (89577 D). 2500 w. A I M E, Bul—Oct., 1918. Discussion of E. L. De Golyer's paper.

The Theory of Volcanic Origin of Salt Domes (86413 D). E. L. de Golyer. 5000 w. A I M E, Bul—May, 1918. Review of the various theories of volcanic origin for salt domes, discussing the supposed Mexican analogy.

Somme Topography

Geographic Suggestions of the Somme Battlefield (85769). Bailey Willis. Maps. 3000 w. Min & Sci Pr—April 20, 1918. Topography of northern France and the Somme battlefield; geological basis.

Sudbury Ores

Genesis of Sudbury Nickel-Copper Ores as Indicated by Recent Explorations (84,361 D). Hugh M. Roberts and Robert Davis Longyear. Maps & Ills. 30 pp. A I M E, Bul—Feb., 1918. Results of exploration of the Sudbury district of Ontario.

Genesis of the Sudbury Nickel-Copper Ores, as Indicated by Recent Exploration (85797 D). 4500 w. A I M E, Bul—April, 1918. Discussion of paper of Hugh M. Roberts and R. S. Longyear.

Sulphides

The Relation of Sulphides to Water Level in Mexico (86912 D). P. K. Lucke. Ills. 900 w. A I M E, Bul—June, 1918. Demonstrates that carbonates of ores may occur below water level and sulphides above, explaining causes of the phenomena.

Survey

Geological Survey in 1916 (82562 A). 4400 w. Ir & Cl Trds Rev—Nov. 2, 1917. Summary of progress.

United States

The Mineral Industries of the United States (84875). Part I. Coal Products: An Object Lesson in Resource Administration. Chester G. Gilbert. Ills. and Map. 14 pp. U S Natl Museum—Bul. 102, Part I.

Utah

Notes on Gold Hill and Vicinity, Tooele County, Western Utah (86867 B). J. F. Kemp and Paul Billingsley. Ills. 27 pp. Ec-Geol—June, 1918. The geology, mines, ore bodies, etc.

The East Tintic District, Utah (84811). Benjamin F. Tibby. Ills. 1500 w. Min & Sci Pr—March 9, 1918. Geology of the deposits of sulphide and oxidized ore.

Veins

The Mechanics of Vein Formation (88,199 D). Stephen Taber. Ills. 34 pp. A I M E, Bul—Aug., 1918. Six different methods, with summary and conclusions.

Volatile Agents

Genetic Classification of Underground Volatile Agents (82403 B). Reginald A. Daly. 20 pp. Ec Geol—Sept., 1917. Critical discussion of technical terms used by geologist, and the need of classification. Suggests a scheme.

IRON AND STEEL

Alloys

On Magnetic Analysis as a Means of Studying the Structure of Iron Alloys

(89546 N). Kôtarô Honda. 43 pp. Ir & St Inst—Sept., 1918. Explains the method of magnetic analysis.

Consult Classification of the Index. See page 9.

IRON AND STEEL

Canada

Analysis

Méthode De Dosage Rapide Du Manganèse Et Du Chrome (85112 C + D). A. Travers. 6000 w. *Revue De Métallurgie*—Nov.-Dec., 1917. Rapid determination of manganese and chromium in steel.

Blast Furnaces

Blast-Furnace Breakouts, Explosions, and Slips, and Methods of Prevention (83007 A). F. H. Willcox. Ills. 267 pp. U S Bur Mines—Bul 130. Study of their dangers, occurrence, and methods of preventing.

Blast-Furnace Practice (86369 A). 6500 w. *Engng*—May 3, 1918. Report of Iron and Steel Institute Committee No. 2, for blast furnace practice in the United Kingdom.

Fuel Economy in Blast Furnaces (86370 A). T. C. Hutchinson. Ills. 2500 w. *Engng*—May 3, 1918. Conditions in the blast furnace that secure long life of furnace lining and the fuel economy resulting.

Blast-Furnace Bears (86727 A). J. E. Stead. Ills. 7500 w. *Ir & Cl Trds Rev*—May 3, 1918. Abstract of paper before Iron & Steel Inst. A study of the characteristics, structure, etc.

Blast Furnace Working (87154). 2500 w. *Times Engng Supp*—May, 1918. Report to Iron & Steel Inst. by special committee.

Fuel Economy in Blast Furnaces (86728 A). T. C. Hutchinson. Ills. 2800 w. *Ir & Cl Trds Rev*—May 3, 1918. Conditions that secure long life of furnace lining and the resulting fuel economy.

Blast-Furnace Bears (87384 N). J. E. Stead. Ills. 41 pp. *Ir & St Inst*—May, 1918. Study of the variable characters of bears, their constituents and their genesis.

Entire Blast Furnace Plant Salvaged (87791 A). Ills. 1000 w. *Iron Age*—July 25, 1918. Removal of a Midland, Ont., stack and its re-erection at Sault Ste. Marie.

Inquiry on Blast-Furnace Practice in the United Kingdom (87379 N). 18 pp. *Ir & St Inst*—May, 1918. Questions and summaries of replies from about 26 firms, on the effect of condition of raw materials, and on gas-cleaning.

Modern German Blast-Furnace Plant (87416 A). Ills. 1000 w. *Ir & Cl Trds Rev*—June 21, 1918. Description given by Max Weidler, in *Stahl und Eisen*

of No. 1 Plant at Oberhausen, as it will be when remodeled.

Slag Viscosity Tables for Blast Furnace Work (83876 D). A. L. Field and P. H. Royster. Abstract of Tech. paper 187 of U S Bur Mines. 2000 w. *A I M E*—Dec., 1917. Purpose and scope of slag viscosity tables, their use, etc.

Temperature-Viscosity Relations in the Ternary System $\text{CaO-Al}_2\text{O}_3\text{-SiO}_2$ (83875 D). A. L. Field and P. H. Royster. Abstract of Tech. paper 189, of U. S. Bur. of Mines. 2500 w. *A I M E*—Dec., 1917. General features of experimental work and conclusions.

Unique Feat in Blast Furnace Building (85708 A). Ills. 2500 w. *Iron Age*—April 18, 1918. Within one year 600-ton stack is completed; details of stoves and valves.

Blooming Mills

The Design of Blooming Mills (85300 A). H. H. Hummel. 4000 w. *Iron Age*—March 28, 1918. Faults of existing plants and the needed improvements.

Blowing Engine

1500 H.P. Gas Blowing Engine (87-942 A). 1200 w. *Engr*—July 5, 1918. Illustrated detailed description.

Brazil

Les Minerais De Fer Du Brésil (85111 C + D). F. De Souza-Dantas. 4000 w. *Revue De Métallurgie*—Nov.-Dec., 1917. Iron ores of Brazil, blast furnaces and steel works.

Briey Iron Mines

Iron Mines Which Allies May Capture (88936 A). Map. 2000 w. *Iron Age*—Sept. 19, 1918. The French-Lorraine mines of the Briey district, seized by Germany in 1914, may be captured.

Briquetting

Le Briquetage Des Minerais De Fer Pulverulents (89081 B). Ills. 4200 w. *Génie Civil*—Aug. 17, 1918. Serial, 2d part. Processes for briquetting iron-bearing minerals and blast furnace dust.

British Columbia

Opportunities for the Establishment of an Iron and Steel Industry in British Columbia (84519 N). Robert R. Hedley, with discussion. 3000 w. *Can Min Inst, Trans*—1917. Reviews conditions.

By-Products

By-product Recovery in Iron and Steel Works (88866 A). 2200 w. *Engng*—Aug. 23, 1918. Editorial review of subjects dealt with in a paper by A. Gouvy dealing with the recovery and utilization of by-products.

IRON AND STEEL

Electric Furnaces

Canada

The Iron Resources of Canada (87545 A). 5000 w. Engng—June 21, 1918. Reviews a recent report issued by the Canada Dept. of Mines.

Iron Ore Occurrences in Canada (85267 N). E. Lindeman and L. L. Bolton. Ills. and Maps. Vol. II. Descriptions of Iron Ore Occurrences. 200 pp. Can Dept Mines—No. 217.

Iron Ore Occurrences in Canada (82886 N). E. Lindeman and L. L. Bolton. Maps & Ills. 65 pp. Can Dept Mines—No. 217. Descriptions of principal iron ore mines.

Notes on the Future of Iron and Steel Trade in Canada (82391 N). W. G. Dauncey. 1500 w. Can Min Inst, Bul—Nov., 1917. Problems and future outlook.

The Production of Iron and Steel in Canada During the Calendar Year 1916 (82382 N). John McLeish. 50 pp. Can Dept Mines—No. 458. Advance chapter of annual report.

The Present Position and Future of the Iron and Steel Industries in Canada (84518 N). Corbett F. Whitton, with discussion. 56 pp. Can Min Inst, Trans—1917. Analysis of the present situation, particularly the commercial and manufacturing side.

Carbon Determination

Combustion Train for Carbon Determination (88310 A). J. B. Stetser and R. H. Norton. Ills. 3300 w. Iron Age—Aug. 22, 1918. Apparatus giving results in 6 min. and meeting color test inaccuracies arising from varying heat treatment of samples.

Carbonized Steel

The Penetration of Carbon (86051). Howard Ensaw. Ills. 1800 w. Am Mach—May 2, 1918. Value of parts made from carbonized steel depends upon thoroughness with which the work is done. Various phases of the work.

Cast-Iron

Laws Governing the Fluidity of Molten Cast Iron (89163). Matthew Ridell. 3500 w. Can Fndman—Sept., 1918. Factors which affect the melting point. Vagaries in cupola operation.

Method for the Prevention of Growth in Grey Cast Iron (89547 N). J. E. Hurst. Ills. 5 pp. Ir & St Inst—Sept., 1918. Causes of growth and methods of prevention.

Phosphorus in Malleable Cast Iron (89552 N). J. H. Teng. Ills. 19 pp. Ir & St Inst—Sept., 1918. Investigations undertaken to examine the effect of proportions of phosphorus varying from 0.05 to 0.5 per cent. on the mechanical properties of malleable cast iron.

China

The Iron Ore of China (86137 A). 1000 w. Engr—Apr. 12, 1918. Japanese control of valuable mines in China.

Cobalt Steel

The Determination of Cobalt and Nickel in Cobalt Steel (87392 N). W. R. Schoeller and A. R. Powell. 5 pp. Ir & St Inst—May, 1918. Description of method.

Construction

New Iron and Steel Works Construction (83449 D). 12 pp. Iron Age—Jan. 3, 1918. (Special No.) Open-hearth steel capacity completed last year 4,326,500 tons—that now building represents 1,645,000 tons.

Continuous Mills

Practical Operation of Motor-Driven Continuous Mills (85714 N). H. C. Cronk. 2500 w. Assn I S E E—Jan., 1918. Operating features of mills of the Morgan Construction Co. type.

Copper Tuyeres

Copper Tuyeres for Blast-Furnaces (87383 N). A. K. Reese. Ills. 6 pp. Ir & St Inst—May, 1918. Advantageous features as compared with cast iron tuyeres.

Corrosion

The Corrosion of Iron and Steel and Its Prevention (88303). Abe Winters. 1500 w. Can Fndman—Aug., 1918. Important factors in the process of sherardizing. Requirements.

Damascene

Damascene Steel (88400). 1000 w. Nature—June 20, 1918. Abstract of paper at British Iron and Steel Institute.

Efficiency

Iron Works Efficiency: Some Engineering Features (86810 N). Frank Anslow, with discussion and correspondence. Ills. 42 pp. West Scot I & S Inst, JI—Jan.-Feb., 1918. Reviews developments, problems to be solved, the outlook, etc.

Le Service D'Economie De Combustible (87114 C + D). T. Laurent. Ills. 4300 w. Revue De Metallurgie—Mar.-Apr., 1918. Attainment of fuel economy through scientific methods at important French foundry and steel works.

Electric Furnace

The Electric Furnace in the Steel Casting Industry (89010 A). W. E. Moore. 2000 w. Elec JI—Sept., 1918. Former methods of producing steel are reviewed and the quality produced in the electric furnace and other advantages.

The Booth-Hall Electric Steel Furnace (83443 D). Ills. 2500 w. Iron Age—Jan. 3, 1918. (Special No.) New type operating at the plant of the Midland Electric Steel Co., Terre Haute, Ind.

Electric Steel

The First Electric Steel-Melting Furnace in South Africa (83216 N). W. Buchanan and George H. Stanley, with discussion. Ills. 37 pp. So Af Inst Elec Engrs, Trans—Sept., 1917. Details of furnace and plant and the operation and results.

Electric Heating and Heat Treating (87980). T. F. Baily. Ills. 1500 w. Auto Ind—Aug. 1, 1918. The advantages of the electric furnace for forge shop use.

La Production Électrothermique Des Fontes Et Aciers (88409 B). J. Escard. Ills. 5500 w. Revue Générale Des Sciences—June 30, 1918. Serial, 1st part. Various types of electric steel and blast furnaces described.

The Webb Electric Steel Furnace (87-930 A). Ills. 2000 w. Iron Age—Aug. 1, 1918. A high voltage unit developed and operated by the Old Dominion Iron & Steel Corporation.

Electric Steel and the Forging Industry (87522 N). Arthur V. Farr. From paper before Am. Drop Forge Assn. Ills. 1800 w. Iron Age—July 11, 1918. Steel from cold or hot metal.

Triplex Process of Making Electric Steel (87245 A). Theodore W. Robinson. Excerpt from paper before Am. Ir. & St. Inst. Ills. 3500 w. Chem & Met Eng—July 1, 1918. Development at South Chicago of the world's largest electric steel plant.

Triplex Process of Making Electric Steel (86733 A). Theodore W. Robinson, with discussions. Ills. 4500 w. Iron Age—June 6, 1918. Past and present outlook and future estimate.

Development of Electric Cast-steel Anchor Chain (86764 A). W. L. Merrill. Ills. 1800 w. Gen Elec Rev—June, 1918. An economical method of greatly increasing the production of stud-link anchor chain.

Electric Steel (87876 A). Franklin D. Jones. Ills. 6000 w. Machy—Aug., 1918. Applications of the electrical process in steel making; its advantages.

Electricity

Electricity as a Fuel Saver in the Iron and Steel Industry (83082 A). A. H. Marshall. 4500 w. Ir & Cl Trds Rev—Nov. 30, 1917. Abstract of presidential address before Newcastle Local Sec of the I. E. E.

Electrometallurgy

The Status of the Electric Steel Industry (83448 D). 2500 w. Iron Age—Jan. 3, 1918. (Special No.) Progress since 1910. United States foremost in output.

IRON AND STEEL**Furnaces**

Pig-Iron from Scrap-Steel (84859). Ills. 1200 w. West Eng—March, 1918. About 50 tons of pig-iron is produced per day in electric furnaces at Watervliet, N. Y.

Engineering Industries

The Iron, Steel, and Engineering Industries in 1917 (83762 A). 5000 w. Engr—Jan. 4, 1918. Serial, 1st part. Annual review of industries in Great Britain.

Ferromanganese

Liquid Ferromanganese in Steel Making (87793 A). E. C. Hummel. 1500 w. Iron Age—July 25, 1918. Advantages over using the solid alloy.

Ferro-Uranium

Preparation of Ferro-Uranium (84022 A). 2500 w. Engng—Jan. 11, 1918. Editorial on the paper of H. W. Gillett and E. L. Mack.

France

Iron and Coal in France After the War (87409 A). 2500 w. Ir & Cl Trds Rev—May 24, 1918. Serial, 1st part. Opinions in regard to the workable deposits, and the value of mines taken by Germany.

Les Hauts Fourneaux De Caen (85120 B). A. Pawlowski. Ills. 2900 w. La Nature—Feb. 16, 1918. Blast furnaces and steel plates at Caen, northwestern France.

Fuel

Fuel Economy in Blast Furnaces (87382 N). T. C. Hutchinson. Ills. 14 pp. Ir & St Inst—May, 1918. Conditions in blast-furnaces that secure long life of furnace lining, and the resulting fuel economy.

Fuel Economy

Fuel Economy in Modern Steel Works Unit (88862 A). 3000 w. Ir & Cl Trds Rev—Aug. 23, 1918. From report by Benjamin Talbot, published as Appendix to Coal Conservation Committee's report.

Fuels

Coke as Blast Furnace Fuel (84371 A). Abstract of paper by G. W. Hewson, with discussion. 4500 w. Colly Gdn—Jan. 25, 1917. Characteristics of fuel desirable for blast furnaces, etc.

Fuel-Saving

Newcastle Local Station: Chairman's Address (83611 N). A. H. W. Marshall. 5800 w. Instn E E, J1—Dec., 1917. Electricity, and its bearing on fuel-saving in the iron and steel trades.

Furnaces

The Principles of Open-Hearth Furnace Design (89203 A). Charles H. F. Bagley. Ills. 4500 w. Ir & Cl Trds Rev

Furnace Design

—Sept. 13, 1918. (Abstract.) Points of importance in designing the furnace, its management, etc.

Electric Steel Refining Furnaces (84847 A). James Bibby. Ills. 4500 w. Ir & Cl Trds Rev—Feb. 15, 1918. Read before the Faraday Soc. Their advantages. The metallurgical requirements for refining, etc.

Furnace Design

The Principles of Open-Hearth Furnace Design (89539 N). Charles H. F. Bagley. Ills. 19 pp. Ir & St Inst—Sept., 1918. Discusses the subject of design from the scientific and practical viewpoints.

Furnace Doors

Automatic Door Hoists for Open Hearth Furnaces (88944 N). W. H. Burr and H. A. Lewis. Ills. 2000 w. Assn I S E E—May, 1918. Describes equipment involving a new idea.

Furnace Roofs

Silica Brick in Open-Hearth Furnace Roofs (87932 A). 2500 w. Iron Age—Aug. 1, 1918. Deterioration as observed by French authorities.

Gas Cleaning

A New Blast Furnace Gas-Cleaning Machine (82433 A). John Ruddiman. Ills. 3000 w. Met & Chem Eng—Nov. 15, 1917. Detailed description of machine having interesting features for iron and steel blast-furnaces.

Gas Furnaces

Gas Furnaces as Re-Heaters of Iron Piles, etc. (84667 A). George Carrington. Abstract of paper read before Staffordshire Ir. & St. Inst. 3000 w. Ir & Cl Trds Rev—Feb. 8, 1918. Features of the gas furnace as compared with the coal-fired reverberatory furnace, favoring the latter. Short discussion.

Germany

See same heading under Coal and Coke. L'Approvisionnement De L'Allemagne (85125 B). J. T. Laspière. 5100 w. Le Génie Civil—Feb. 9, 1918. Serial, 1st part. The iron ore resources of Germany. Charts of pre-war production, etc.

Grain Growth

Grain-Growth in Deformed and Annealed Low-Carbon Steel (82966 N). Ralph H. Sherry, with discussion. Ills. 20 pp. Faraday Soc, Trans—June, 1917. Investigates the phenomenon of coarse crystallization.

Grain-Size

Grain-Size Inheritance in Iron and Carbon Steel (85790 D). 3000 w. A I M E, Bul—April, 1918. Discussion of the paper of Zay Jeffries.

IRON AND STEEL**Iron & Steel**

Grain-Size Inheritance in Iron and Carbon Steel (82499 D). Zay Jeffries. Ills. 16 pp. A I M E, Bul—Nov., 1917. Brief discussion of Prof. Howe's paper on The Supposed Reversal of Inheritance of Ferrite Grain Size from that of Austenite. Also general subject of grain refining in steel and iron.

Heat Treatment

Application of Heat in Steel Treating (84755 A). A. F. MacFarland. Ills. 2500 w. Iron Age—March 7, 1918. Principles of generation by electricity, gas, oil, or powdered coal.

India

Technical Aspects of the Establishment of the Heavy Steel Industry in India, with Results of Some Researches Connected Therewith (87385 N). Andrew McWilliam. 20 pp. Ir & St Inst—May, 1918. Historical account.

The Tata Iron and Steel Works: Their Origin and Development (85035 A). H. M. Surtees Tuckwell, with discussion. Ills. 15 pp. Roy Soc Arts, JI—Feb. 1, 1918. Origin and development of these works and the effect upon the industrial prosperity of India.

Ingots

Defects in Steel Ingots (87386 N). J. N. Kilby. Ills. 24 pp. Ir & St Inst—May, 1918. Previous conclusions upon influence of casting, with observations and results. Some reference to the electric process.

Production of Sound Steel by Lateral Compression of the Top Portion of the Ingot (87348 A). Benjamin Talbot. Ills. 1200 w. Read before Iron & Steel Inst. Engr—May 31, 1918. Describes an apparatus for compressing the top part of the ingot after removal from the mould.

The Development of the Sand-Cast Forging-Ingot (89564 A). W. L. Booth. Ills. 900 w. Met Trds—Oct., 1918. A sand-cast ingot is being produced in San Francisco that is equal to best Eastern ingots.

Defects in Steel Ingots (86729 A). J. N. Kilby. Ills. 5000 w. Ir & Cl Trds Rev—May 3, 1918. Observations and results.

Iron Founding

Links in the History of Engineering (83133 A). Rhys Jenkins. 1200 w. Engr—Dec. 7, 1917. Serial, 1st part. The beginning of iron founding in England.

Iron & Steel

Iron Ore Production and Iron and Steel Making Capacity in the United States (82199). 2000 w. Eng & Con—

Iron Atoms

Oct. 31, 1917. Information concerning iron and steel products; production and consumption.

Iron Atoms

The Experiences of an Iron Atom (82163 B). Charles R. Sturdevant. 19 pp. Cleve Eng Soc, J1—Sept., 1917. The cycle of changes through which an atom passes.

Iron Industry

Economic Factors in the Iron Industry (85547 A). Malcolm Keir. 2500 w. Iron Age—April 11, 1918. Serial, 1st part. Brief history of development in the United States.

Iron Ore

Notes on Certain Iron-ore Resources of the World (88773 D). E. C. Harder, W. Lindgren, C. M. Weld, A. C. Spencer, H. F. Bain, Sidney Paige. 25 pp. A I M E, Bul—Sept., 1918. Notes on Brazil, Scandinavia, Cuba, Europe, China and Alsace-Lorraine.

British and Colonial Iron Ore Supplies (87765 A). 1200 w. Engng—June 28, 1918. Information concerning reserves and possibilities of Colonial supplies.

Metalliferous Ores of the Iron and Steel Industry (89714 A). H. C. H. Carpenter. 1000 w. Nature—Sept. 5, 1918. Abstract of report of Dept. of Scientific and Industrial Research, England.

Iron Ore Report of Advisory Council Department of Scientific and Industrial Research (87069). Map. 9000 w. Eng & Min J1—June 22, 1918. Summary of a report on the iron-ore situation today, with a synopsis of other metals used in making steel products.

Shortage of Supply of Non-Phosphoric Iron Ore (83910). W. G. Fearnside. Ills. 2000 w. Nature—Nov. 22, 1917. Abstract of Howard Lectures before Royal Society of Arts.

Iron Problem

The Foundrymen's Iron Problem (89594). C. J. Stark. 5400 w. Ir Trd Rev—Oct. 17, 1918. How the war industries board handles distribution.

Iron Supplies

Furnace Interests Control the Distribution of Iron (88016). 1800 w. Fndry—Aug., 1918. Essential industries will be first supplied.

Iron Trade

Reviews of Iron, Steel and Other Metals in 1917 (83446 D). 18 pp. Iron Age—Jan. 3, 1918. (Special No.) Reviews by different writers of the developments in important markets. Production, prices, wages, etc.

IRON AND STEEL**Malleable Iron**

British Iron and Steel Trades in 1917 (83537 A). L. H. Quin. 1800 w. Iron Age—Jan. 10, 1918. Strictest government control throughout the year.

The Iron and Steel Trade in 1917 (83772 A). 4500 w. N & CI Trds Rev—Jan. 4, 1918. District reviews.

Japanese Steel

Japanese Development in Steel Making (86279 A). Thomas T. Read. Map & Ills. 2500 w. Iron Age—May 16, 1918. Japan's resources, steel consumption and prospects. Dependence on Asiatic ores.

Laboratory

Speeding Up the Steel Works Laboratory (89379 A). H. C. Kimber. Ills. 2500 w. Chem & Met Eng—Sept. 28, 1918. Suggestions and methods of analysis of value in the production of electric steel.

Lake Superior Districts

Reminiscences of the Development of the Lake Superior Iron Districts (84423 N). John M. Longyear. 13 pp. L S Min Inst, Pro—1917.

Limonite

The Limonite Deposits of Mayaguez, Porto Rico (84065 D). Charles R. Fetteke and Bela Hubbard. Ills. 16 pp. A I M E, Bul—March, 1918. Physiography and geology, character of the ore, origin, etc.

Liquid Steel

The Determination of the Temperature of Liquid Steel Under Industrial Conditions (86716 A). Cosmo Johns. Faraday Society-Conference on pyrometry. 2500 w. Engr—May 3, 1918. Trained observers using a correct type of pyrometer can obtain readings of sufficient accuracy to secure effective control of the process.

The Determination of the Temperature of Liquid Steel Under Industrial Conditions (82841 A). Cosmo Johns. 3000 w. Ir & CI Trds Rev—Nov. 16, 1917. The use of pyrometers.

Machine Working

The Problem of Man-Power in Home Iron-Ore Supply Fields: Mechanical Appliances the Solution (86387 A). W. Barnes. Ills. 4000 w. Ir & CI Trds Rev—Apr. 5, 1918. Describes the leading features of the principal machines used in working shallow deposits of iron ore.

Malleable Iron

How Malleable Iron Has Improved (82231). Enrique Touceda. Read at Boston meeting of Am. Fndry. Assn. 1500 w. Fndry—Nov., 1917. Outlines progress made recently.

Pulverized Coal for Melting Malleable Iron (82232). W. R. Bean. 2200 w. Fndry—Nov., 1917. Tests showing advantages for powdered fuel.

Manganese

Widening Fields for Malleable Iron (82272 A). 3000 w. Iron Age—Nov. 8, 1917. Speakers at Am. Ir. & St. Inst. predict greater use.

Manganese

Manganese Conservation in Steel Making (86734 A). C. R. Ellicott, with discussions. 4500 w. Iron Age—June 6, 1918. National requirements and supply.

Manganese at Butte, Montana (86943). Excerpt from Bul. 690-E, U. S. Geol. Survey. 4000 w. Eng & Min JI—June 15, 1918. Composition and types of manganese ores, with estimates of the quantity.

The Determination of Manganese in Steel in the Presence of Chromium and Vanadium by Electrometric Titration (83607 B). G. L. Kelley, M. G. Spencer, C. B. Illingworth, and T. Gray. 4000 w. JI Ind & Eng Chem—Jan., 1918. Shows a method that does not require special skill.

Mesabi

The Mesabi Iron Range (85049 B). Frank B. Walker. Ills. 15 pp. Bos Soc C E, Pro—March, 1918. Account of the mines and ore docks.

Metallurgical Structure

See same heading under Electro-Physics.

Metallurgy

Phases of Iron and Steel Metallurgy in 1917 (83447 D). J. E. Johnson, Jr. 7000 w. Iron Age—Jan. 3, 1918. Special No.) Operating difficulties were a spur to new methods.

Microstructure

On the Microstructure of Certain Titanic Iron Ores (89106 B). Charles H. Warren. Ills. 24 pp. Ec-Geol—Sept., 1918. A microscopic study.

Milwaukee

Milwaukee Historic in Iron Trade (89278). Ills. 3000 w. Ir Trd Rev—Oct. 3, 1918. Sketch of the metal industries.

Minerals

Manganiferous Iron Ores (82492). E. C. Harder. 12 pp. U S Geol Surv—Bul. 666-EE. Reports from various districts, and ways manganiferous ores may be utilized.

Minnesota

Manganiferous Iron Mining in the Cuyuna District, Minnesota (84215). P. M. Ostrand. Ills. 4000 w. Eng & Min JI—Feb. 9, 1918. Production and methods of mining.

New Plant

New Steel and Wire Plant (83442 D). Ills. 1800 w. Iron Age—Jan. 3, 1918.

IRON AND STEEL**Plate Mill**

(Special No.) Plant of Keystone Steel & Wire Co., near Peoria, Ill.

Ore Deposits

Classification of Ore Deposits Based Upon Origin, Deformation, and Enrichment (83050 B). T. T. Quirke. Chart. 1000 w. Ec-Geol—Oct.-Nov., 1917. Aid in teaching economic geology.

Ore Supplies

British Iron Ore Supplies (85820 B). 3000 w. Cas Eng Mthly—April, 1918. Urging the development of home resources.

Overstrain

Overstrain and Fatigue Failure of Steel as Related to Grain Structure (86695). Henry S. Prichard. Ills. 4000 w. Eng News-Rec—June 6, 1918. Microstructure furnishes explanation of mechanical phenomena.

Pearlite

The Effect of Cold-Work on the Divorce of Pearlite (86711 A). J. H. Whiteley. Read before the Iron & Steel Inst. Ills. 3000 w. Engng—May 17, 1918. A record of observations made in a study of the Eggertz color test for combined carbon. Shows that the effect of cold-work is to produce an alteration in the degree of electrochemical action between the ferrite and cementite while the sample is dissolving.

Phosphorus

Effect of Phosphorus on Soft Steels (86842 A). J. S. Unger. Ills. Abstract of paper before the Iron & Steel Inst. 1800 w. Iron Age—June 13, 1918. Only increased hardness caused in acid and basic open-hearth steels by high phosphorus content; higher tensile strength.

Pickling

The Electrolytic Pickling of Steel (83004 A). M. DeKay Thompson and F. W. Dodson. 1000 w. Met & Chem Eng—Dec. 15, 1917. Results of experiments on block sheet iron and a comparison of electrolytic with chemical pickling.

Pig Iron

Great Importance of Buying Good Pig Iron (89160). E. Standiford. 1500 w. Can Fndman—Sept., 1918. Careful analysis required for strong castings.

The Cost of Electric Pig Iron Production in North Sweden (83379 A). 2000 w. Engng—Dec. 14, 1917. Considers the fuel for the reduction of the ore, the ore, and the power.

Plate Mill

Youngstown Sheet & Tube Tandem Plate Mill (87195 A). Ills. 1500 w. Iron Age—June 27, 1918. Continuous

Production

slab-heating furnaces and new type of plate turnovers, with other features of interest.

Build Hundred and Ten Inch Plate Mill in Six Months (83451). Ills. 2000 w. Eng News-Rec—Jan. 3, 1918. Details of construction of "Liberty Mill" at the Homestead Works, explaining conditions.

The Liberty Mill (83559 A). Ills. 200 w. Int Mar Eng—Jan., 1918. 110-inch plate mill for rolling ship plates for emergency fleet.

The Liberty Mill of the Carnegie Steel Co. (83436 D). Ills. 2500 w. Iron Age—Jan. 3, 1918. (Special No.) A 16000-ton monthly capacity plate mill built in six months at Munhall, Pa.

Production

Cost of Production of Iron and Steel in Canada and the United States (87770 A). Corbett F. Whitton, with discussion. From a paper before the Can. Min. Inst. 3000 w. Ir & Cl Trds Rev—July 5, 1918. Tabulated comparisons of cost and selling prices, with explanatory notes.

A German View of Post-War Iron and Steel Production (88860 A). Dr. A. Birlagier, in *Dewt. Berg. Zeit.* 1500 w. Ir & Cl Trds Rev—Aug. 16, 1918. Discusses the prospects in the export markets after the conclusion of peace.

Decreased Production of Steel Corporation (85302 A). 3500 w. Iron Age—March 28, 1918. Interesting features of the year 1917, taken from annual report.

Rules Governing Priority Are Revised (87931 A). 3500 w. Iron Age—Aug. 1, 1918. Revision of rules and regulations governing priority in production of iron.

Queensland

Proposed Iron and Steel Works in Queensland (88766 N). 3500 w. Qnsd Gov Min JI—July 15, 1918. Report of the Royal Commission.

Reactions

Some Experiments on the Reaction Between Pure Carbon Monoxide and Pure Electrolytic Iron Below the A-1 Inversion (89541 N). H. C. H. Carpenter and C. Coldron Smith. Ills. 52 pp. Ir & St Inst—Sept., 1918. Experimental research work, explaining its objects.

Refining

Refining of Steel by Electric Furnace Process (82905). C. A. Tupper, Ills. 1500 w. Elec Rev, Chi—Dec. 8, 1917. Details and advantages of electric steel smelting and refining.

Regulator

A Volume Regulator for Blast Furnace Engines (82917 A). L. C. Loew-

IRON AND STEEL

enstein. Ills. 40 pp. A S M E—Dec., 1917. The problem of regulating the air supply to a blast furnace.

Rolling Mills

Electrical Reversing Rolling Mill (85536 A). Ills. & Plate. 2000 w. Engng—March 15, 1918. Details of a recently completed plant at Manchester, England.

Electricity as a Factor in Modern Rolling Mill Operation (85822). L. Rothera. Ills. 3000 w. Pr House—April, 1918. Engineering problems connected with the installation of electric drive.

Pass Limitation in Rolling Mill Practice (85350 A). Alfred Musso. Ills. 700 w. Machy—April, 1918. Shows mechanical relations existing between the different elements and how they control the reduction of the piece.

Power Required by Cold Rolling Mills (85527 A). C. E. Davies. 3000 w. Engng—March 15, 1918. Power which should be provided for any size of rolls engaged on a particular class of work.

Russia

Iron and Coal in Russia Before the War (88858 A). From paper by Alexandre Gouvy. Ills. 5000 w. Ir & Cl Trds Rev—Aug. 16, 1918. The resources and future prospects are discussed.

Scrap

Reclaiming High Speed Steel (85667 A). Ills. 1000 w. Ry Mech Engr—April, 1918. Recent process converts scrap into first quality new stock.

Semisteel

Tracing the Development and Use of Semisteel (89161). 1200 w. Can Fndman—Sept., 1918. Proof of its value.

Slag

Slag Control in the Iron Blast-Furnace by Means of Slag Viscosity Tables (89346 A). Alex. L. Field. 7500 w. Chem & Met Eng—Sept. 15, 1918. Method of using the slag viscosity tables illustrated by examples.

The Viscosity of Blast-Furnace Slag and Its Relation to Iron Metallurgy, Including a Description of a New Method of Measuring Slag Viscosity at High Temperatures (84491 N). Alexander L. Feild. Ill. 33 pp. Faraday Soc, Trans—Dec., 1917.

Classification of Furnace Slags (86081). Herbert Lang. 2500 w. Min & Sci Pr—May 4, 1918. Kinds of slags; difficulties, composition, etc.

Spain

Iron and Coal in Spain After the War (84665 A). 2500 w. Ir & Cl Trds Rev—Feb. 8, 1918. Information from articles by Señor Don Julio de Lazúrtegui.

Spain

IRON AND STEEL

Steel Plant

Spiegeleisen

Spiegeleisen in Place of Ferromanganese (83441 D). Edwin F. Cone. 2500 w. Iron Age—Jan. 3, 1918. (Special No.) Experience of some American steel makers.

Steel

Iron and Steel Men Unitedly Back the Nation (82198). Elbert H. Gary. 3300 w. Mfrs' Rec—Nov. 1, 1917. Address at meeting of Am. Ir. & St. Inst., Cincinnati, O.

The Making of Steel in America (88836 N). W. J. Grasswick. Ills. 3500 w. Comwh Engr—Aug., 1918. Abstract of paper before Victorian Inst. of Engrs. Details of processes.

Addendum to the Report of Committee A-1 on Steel (87033 N). 11 pp. Am Soc Test Mat—June, 1918. Reports of three sub-committees.

British Automobile Steels (86769 A). Ills. 2500 w. Autocar—May 18, 1918. Lack of uniform quality and heat treatment charged.

Changes Within the Critical Range of a Given Steel: From Ac 1 to Ac 3-2 (87035 N). J. G. Ayers, Jr. Ills. 10 pp. Am Soc Test Mat—June, 1918. Describes the most important metallographic changes in the critical range of steels.

Non-Metallic Inclusions: Their Constitution and Occurrence in Steel (86730 A). Andrew McCance. Abstract of paper before Iron & Steel Inst. 4500 w. Ir & Cl Trds Rev—May 3, 1918. Their composition and how to avoid them.

Note on Inclusions in Steel and Ferrite Lines (86710 A). J. E. Stead. Ills. 1700 w. Engng—May 17, 1918. Read before the Iron & Steel Inst. Experiments to determine whether or not non-metallic inclusions in steel induce ferrite to crystallize around them.

Damascene Steel (87391 N). N. Belaiew. Ills. 21 pp. Ir & St Inst—May, 1918. History; methods of producing this steel; report of investigations, etc.

La Macrostructure De L'Acier (87706 C + D). A. Portevin and V. Bernard. Ills. 3500 w. Revue De Metallurgie—May-June, 1918. A study of the "macrostructure" of steel by means of the new Stead-Le Chatelier reagent.

Iron, Carbon, and Phosphorus (87390 N). J. E. Stead. Ills. 24 pp. Ir & St Inst—May, 1918. The effect of introducing carbon by cementation into

homogeneous solid solutions of iron and phosphorus; and the temperature ranges in which free phosphide of iron passes in and out of solid solution in iron.

The Effects of Cold-Working on the Elastic Properties of Steel (87389 N). J. A. van den Broek. Ills. 40 pp. Ir & St Inst—May, 1918. A study as to the effects in tension, compression and torsion.

Influence of Hot-Deformation on the Qualities of Steel (89542 N). Georges Charpy. Ills. 18 pp. Ir & St Inst—Sept., 1918. Experiments to determine the influence of hot-working on steel.

On the Cooling of Steel in Ingot and Other Forms (89543 N). J. E. Fletcher. Ills. 40 pp. Ir & St Inst—Sept., 1918. Investigation of the laws which govern the freezing and cooling of steel in metal and sand molds.

Composition and Properties of Steels (89422 A). Howard Ensaw. 2500 w. Am Mach—Oct. 10, 1918. Study of steel alloys in common use. Suggestions.

The Influence of Some Elements on the Tenacity of Basic Steel, with a New Formula for Calculating the Maximum Load from the Composition (89550 N). Andrew McWilliam. 12 pp. Ir & St Inst—Sept., 1918. Results of investigations.

Nickel-Copper Steel (85699 N). R. W. Leonard. 3500 w. Can Soc C E—March 28, 1918. Gives results of experiments with the process patented by G. M. Colvocoresses.

The Effect of the Presence of a Small Amount of Copper in Medium-carbon Steel (83867 D). Carle R. Hayward, and Arch B. Johnston. 1800 w. A I M E, Bul—Jan., 1918. Investigation to obtain data on the mechanical properties.

The History and Romance of Steel (86506 A). Arthur W. Shephard. 12 pp. Keighly Assn Engrs—1916-17. A review.

Molybdenum, Tungsten and Bismuth (84995 A). 2000 w. Aus Min Stan—Feb. 7, 1918. Serial, 1st part. The present article is a preface to a proposed treatise on these metals and compounds. See also page 306.

Steel Output

Chemist's Part in Speeding Up Steel Output (87193 A). A. F. Macfarland. Ills. 2500 w. Iron Age—June 27, 1918. Outlines methods for rapid and efficient preliminary analysis.

IRON AND STEEL

Waste Heat

Steel Plant

Plant of the Wickwire Steel Co. (82271 A). Ills. 700 w. Iron Age—Nov. 8, 1917. Open hearth plant and rolling-mill machinery for producing wire, nails and tacks. Features of interest.

The Corrigan, McKinney New Steel Plant (82429 A). Ills. 5000 w. Iron Age—Nov. 15, 1917. Works including open-hearth furnaces, mills for producing sheet bars, billets and slabs.

Mark Mfg. Co. and Iroquois Iron Co. Merge (87520 A). Ills. 1200 w. Iron Age—July 11, 1918. Consolidation creates a new self-contained steel plant.

Canada's Electric Steel Plant at Toronto (85823 A). Ills. 1500 w. Iron Age—April 25, 1918. Important plant built in fast time to augment the steel supply.

The Keystone Steel and Wire Company (86000 A). F. B. Crosby. Ills. 12 pp. Gen Elec Rev—May, 1918. History of a steel plant of the Middle West, with description of the process of manufacturing steel wire.

Canadian National Steel Plant (88300). Ills. 3000 w. Can Fndman—Aug., 1918. Details of plant layout, equipment, etc.

Steel Treating

Principles of the Generation and Application of Heat in Steel Treating (84865 A). A. F. MacFarland. Abstract of paper before Chicago Sec. of Steel Treating Research Soc. 1500 w. Ry Mech Engr—March, 1918. Fundamental principles involved as exemplified in some of the methods in use.

Principle of the Generation and Application of Heat in Steel Treating (85546). A. F. MacFarland. Ills. 3000 w. Am Mach—April 11, 1918. General principles underlying the selection and use of heat-treating furnaces.

Steel Works

Broken Hill Proprietary Company's Iron and Steel Works, Newcastle, N. S. W. (89116 N). Ills. 5500 w. Chem Eng & Min Rev—Aug. 5, 1918. Detailed description.

Proposed Iron and Steel Works in Queensland (89117 N). E. C. Saint-Smith. Ills. 4500 w. Qnsd Gov Min J1—Aug., 1918. Report of the government geologist concerning the occurrences of iron in this state.

Steel Works

The Slick Wheel Mill (88477 A). Ills. 3500 w. Iron Age—Aug. 29, 1918. Com-

mercial products formed directly from large rolled bars by rolling forging process at Cambria Steel Works.

Stellite

Stellite Developed by Arc Furnace (89595). Elwood Haynes. Ills. 1000 w. Ir Trd Rev—Oct. 17, 1918. Now produced in commercial quantities in electrically-heated crucibles.

Quelques Observations Sur Le Stellite (88407 C + D). L. Guillet and H. Godfroid. Ills. 1200 w. Revue De Metallurgie—July-Aug., 1918. Notes on Stellite: structure, chemical analysis, etc.

Sudbury Ores

Nickel-Copper Steel Direct from Ludbery Ores (83623). F. H. Mason. 1200 w. Min & Sci Pr—Jan. 12, 1918. Analyses of ore and steels; methods and tests.

Tilting Furnaces

Tilting Metal Mixers and Steel Furnaces (84257 A). H. Stonewall Jackson. 2000 w. Ir & Cl Trds Rev—Jan. 25, 1918. Abstract of paper read before Cleveland Instn. of Engrs., with short discussion. Progress in design.

Tin Plate

The Manufacture of Tin Plate (83439 D). Clement F. Pappleton. Ills. 6500 w. Iron Age—Jan. 3, 1918. (Special No.) Equipment of the modern plant.

Trade

Iron and Steel Trade After the War (87413 A). 7000 w. Ir & Cl Trds Rev—June 14, 1918. Serial, 1st part. Report of Board of Trade Committee.

Tungsten Works

Tungsten and High-Speed Steel (83067 A). 3500 w. Engng—Nov. 30, 1917. Describes processes of making high-speed steel by alloying the tungsten with iron.

Tuyeres

A Few Notes on Bosh Tuyeres (89545 N). J. Hollings. Ills. 8 pp. Ir & St Inst—Sept., 1918. Circumstances which led to their adoption and results of experience.

Warping

Note on the Warping of Steel Through Repeated Quenching (89553 N). J. H. Whiteley. Ills. 1000 w. Ir & St Inst—Sept., 1918. Describes results of quenchings on a cylindrical piece of soft steel.

Waste Heat

See same heading under MECHANICAL ENGINEERING, *Steam Engineering*.

MINE OPERATION

Coal Economy

Asbestos

Asbestos Mining in Tasmania (83631 A). Hartwell Conder. Ills. 2000 w. Aust Min Stand—Dec. 6, 1917. Describes this industry and the outlook.

Australia

The Broken Hill South Mine (84187 A). W. E. Wainwright and P. H. Warren. Ills. 2500 w. Min Mag—Jan., 1918. One of the most important mines on the Barrier Range. High-grade lead-zinc-silver ore.

Axles

Mine-Car Axles (87952). B. P. Lieberman. Ills. 2500 w. Cl Age—Aug. 1, 1918. Proper size, structure, ductility, material, etc.

Blackdamp

The Origin of Blackdamp (87415 A). J. Ivon Graham. Abstract of paper before Instn. of Min. Engrs. 1600 w. Ir & Cl Trds Rev—June 14, 1918. Possible sources of the carbon dioxide and nitrogen of blackdamp.

Blasting

Blasting Methods at Ajo (87537). S. U. Champe. Ills. 1200 w. Min & Sci Pr—July 13, 1918. Excavation of hard copper ore at the mines of the New Cornelia company. Methods.

Blasting Methods at Ajo (88155). S. U. Champe. Ills. 1000 w. West Eng—Aug., 1918. Work in copper ore in advance of the steam-shovel used in open-cut work in Arizona.

Chamber Blasting Methods and Costs (88933). E. E. Baker, in *Min. & Sci. Pr.* (Abstract.) 5000 w. Eng & Con—Sept. 18, 1918. On blasting for steam shovel work in mining operations. Method at Chuquicamata, Chili.

Some Notes on Experiments Made With a View to Reducing the Consumption of Explosives, and Increasing the Fathoms Broken per Machine Shift in Machine Stopping (88693 N). T. H. Bayldon. 3000 w. So Af Instn Engrs, Jl—July, 1918. Details of experiments.

Blasting Explosives and Their Accessories (84427 N). Charles S. Hurter. Ills. 50 pp. L S Min Inst, Pro—1917. Their nature, detonation, etc.

Use of Powder in Opencut Blasting (84464). E. S. Jacobson. 2200 w. Eng & Min Jl—Feb. 23, 1918. Practical suggestions, based on experience.

Bucket Elevators

Design and Construction of Bucket Elevators (83281). Roy Reddie. Ills. 7000 w. Eng & Min Jl—Dec. 29, 1917. The belt-bucket type of elevator, when

properly designed, gives an efficient and economical means of elevating wet or dry crushed ore.

Butte

Mining at Butte (83488). Ben F. Evans. Ills. 2200 w. Min & Sci Pr—Jan. 5, 1918. Labor troubles; November output of the Anaconda; influence of prices of copper and silver.

Caved Stopes

Recovering Caved Stopes in Narrow Veins (86942). Claude T. Rice. Ills. 6000 w. Eng & Min Jl—June 15, 1918. Serial, 1st part. Causes and effects of stope caving with special regard to the Coeur d'Alene mines, and methods to recover stopes.

Cement Gun

Use of the Cement Gun in the Coeur d'Alene Mining District (85968). Ills. 1200 w. Eng & Min Jl—April 27, 1918. Concreting a cribbed wall, a reservoir, ore bins, thickening tank and buildings, at a cost estimated at about two-thirds that of hand plastering.

Cement Gun in Mining Work (84952). George S. Rice. Ills. 3500 w. Cl Age—March 16, 1918. Serial, 1st part. Early use of concrete and cement grout in mines and the introduction of the cement gun. Its operation and results.

Cementation Process

Cementation Process Applied to Mining (François System) (88587 N). A. H. Krynauf, with short discussion. Ills. 12 pp. Chem, Met & Min Soc S Af, Jl—May, 1918. Details of the process and its successful applications.

The Cementation Process at the Hatfield Main Sinking (87906 A). H. N. Berry, with discussion. 4500 w. Ir & Cl Trds Rev—July 12, 1918. An account of the use of this process in sinking through water-bearing strata.

Central Plant

Power Plant of the St. Joseph Lead Co. (82517). E. L. Broome. Ills. 2000 w. Eng & Min Jl—Nov. 17, 1917. New central power plant in Missouri, serving several mines.

Chronology

Mining Chronology of 1917 (83824). R. Dawson Hall. 2500 w. Cl Age—Jan. 26, 1918. Important events.

Coal Economy

Coal Economy in Mine Boiler Firing (88965 A). Ills. 1000 w. Eng & Min Jl—Sept. 21, 1918. Method of using a carbon dioxide recorder for controlling the composition of flue gases from large steam boilers.

MINE OPERATION

Haulage

Comstock Lode

Mining Lower Levels of the Comstock Lode (86744). Lewis H. Eddy. Ills. 2200 w. Eng & Min JI—June 8, 1918. Reviews conditions at Virginia City, Nev. Completion of drainage facilities and development of ore bodies.

Conveyors

A Reciprocating Underground Coal Conveyor (89470). J. F. K. Brown. Ills. 1800 w. Cl Age—Oct. 10, 1918. Used successfully in coal beds having an inclination.

Underground Conveyors (84671 A). Harold C. Jenkins. Ills. Read before Midland Inst. of Min., Civ., & Mech. Engrs. 4000 w. Colly Gdn—Feb. 8, 1918. Types in use, their installation, etc.

Crushing Plant

Crushing Plant at Brier Hill Shaft (84425 N). Floyd L. Burr. Ills. 10 pp. L S Min Inst, Pro—1917. Construction and equipment.

Deep Mining

Presidential Address at Nottingham Meeting of the Institution of Mining Engineers (89197 A). George Blake Walker. 4000 w. Colly Gdn—Sept. 13, 1918. Deals particularly with the conditions of mining at great depths.

Drift-Mining

Drift-Mining in California (82516). J. D. Hubbard. Ills. 2500 w. Eng & Min JI—Nov. 17, 1917. Methods applied to California buried gravel beds.

Drill Bits

Relative Merits of Carr and Cross Bits as Disclosed by Drilling Tests (83861). 700 w. Eng & Min JI—Jan. 26, 1918. Reviews development of various classes of bits and conditions under which special types may be employed.

Drilling

Mechanical Equipment and the Conservation of Miners (88900). R. L. Herrick. Ills. 2500 w. Com Air Mag—Sept., 1918. Examples of man-power saving observed in the anthracite district.

Drills

A Gasoline-Driven Diamond-Drill Outfit (88358 A). J. M. Longyear, Jr. 2500 w. Eng & Min JI—Aug. 24, 1918. Successful operation in northern Michigan iron-ore district.

Electric Power

Electrical Power in Mining on the Menominee Range (84422 N). Charles Harger. Ills. 13 pp. L S Min Inst, Pro—1917. Three plants are described.

Electrolysis

Electrolysis Underground in Mines (82551 A). 2200 w. Colly Gdn—Nov.

2, 1917. Cases under the writer's notice; methods of distribution underground, etc.

Elevators

Otis Passenger Elevator at Inspiration Shaft (83874 D). C. E. Arnold. Ills. 1200 w. A I M E—Dec., 1917. Amplifies description given by H. Kenyon Burch in a recent paper.

Excavator

The Tailing Excavator at the Plant of the New Cornelia Copper Co., Ajo, Ariz. (88201 D). Franklin Moeller. Ills. 6 pp. A I M E, Bul—Aug., 1918. Details.

Ferroalloys

To Increase Domestic Ore for Ferroalloys (85710 A). 2500 w. Iron Age—April 18, 1918. Plan for government operation of mines.

Fires

Measures for Controlling Fires at the Copper Queen Mine (83868 D). Gerald Sherman. Ills. 1200 w. A I M E, Bul—Jan., 1918. Notes on preparations to check fire and facilitate the escape of workmen.

Floor Sampling

Sampling of Mine Floors (83280). Albert G. Wolf. 2000 w. Eng & Min JI—Dec. 29, 1917. Methods for diverting the flow of water in drifts where floor samples are to be taken.

Gas Ignition

The Possibilities of Gas Ignition by Miners' Electric Lamps (86386 A). L. Fakes. Ills. 2500 w. Ir & Cl Trds Rev—April 5, 1918. Results of tests made to determine under what conditions ignition is possible.

Gasoline Engines

Suggestions for the Safe Operation of Gasoline Engines in Mines (83648). R. H. Kudlich and Edwin Higgins. Ills. 15 pp. U S Bur Mines—Tech paper 174. Deals especially with precautions that should be taken to prevent mine fires or explosions, or air pollution.

Government Operation

Government Operation of Mines (82345). Frederick F. Sharpless. 1000 w. Eng & Min JI—Nov. 3, 1917. Conscripted industry needed.

Haulage

Haulage Experience (89204 A). James Gilchrist. Read before Scottish Br. of Natl. Assn. of Colly. Mgrs. Ills. 3000 w. Ir & Cl Trds Rev—Sept. 13, 1918. Details of best known methods now in use in connection with underground haulage.

Mine Trackage for Motor Haulage (85946). Dever C. Ashmead. 2500 w.

Haulage Roads

Cl Age—April 27, 1918. Influence of condition of haulage tracks; hints on track maintenance.

Haulage Roads

Rounding Curves on Haulage Roads (83155 A). William Dakin, with discussion. Ills. 8000 w. Ir & Cl Trds Rev—Dec. 7, 1917. Read before Natl. Assn. of Colly. Mgrs. Problems of endless rope haulage.

Hoisting

Hoisting by Stages From Deep Mines (87539). R. A. Balzari. Ills. 1300 w. Min & Sci Pr—July 13, 1918. Underground hoist used at Argonaut mine, California, is described.

Colliery Cable Suggestions ((87756 A). A. R. Davies. Ills. 2000 w. Ir & Cl Trds Rev—June 28, 1918. Read before Min. Elec. Engrs. Types and method of erection are considered.

Overhead Kolpe Winding Plant at Plennmeller Colliery, Haltwhistle (87354 A). George Raw. Ills. 5000 w. Colly Gdn—June 7, 1918. From paper before N. of Eng. Inst. of Min. & Mech. Engrs. Description of plant, winding rope, rope slip, etc.

Hydraulic Mining

Syphoning Gravel (83839 N). J. Jervis Garrard. Ills. 2000 w. Instn Min & Met, Bul. 159—Dec. 13, 1917. Method of hydraulicking and elevating by means of a syphon.

Hydraulic Stowing

Some Primary Considerations in Hydraulic Stowing in Mines, with a Note Particularly Relating to the Coal-fields of Bihar (89592 N). C. A. John Henry. 6 plates. 38 pp. Min & Geol Inst of India, Trans—April, 1918. Factors to be taken into consideration.

Laws

Siamese Mining Laws (84189 A). 2000 w. Min Mag—Jan., 1918. Latest enactments regulating mining in Siam.

Machine Mining

Machine Mining at La Salle, Illinois (89019). George W. Harris. Ills. 1200 w. Cl Age—Sept. 19, 1918. Longwall machine mining in thin-vein fields.

Manitoba

Mining in Northern Manitoba (84895 N). E. L. Bruce. Ills. 2200 w. Can Min Inst, Bul—March, 1918. History of the district, difficulties of transportation, geology, deposits, etc.

Mechanical Equipment

Conservation of Miners by Employment of Mechanical Equipment (87854). R. L. Herrick. Ills. 4000 w. Cl Age—July 25,

MINE OPERATION**Mine Air**

1918. How the introduction of modern machinery conserves man-power.

An Electrically Interlocked Car Haul and Car Feeder (88236). R. R. Hines. Ills. 1500 w. Cl Age—Aug. 15, 1918. Describes the two pieces of apparatus.

Mechanical Mining

Some Personal Experiences in Mechanical Mining, and Peculiar Geological Features in a South Wales Colliery (86385 A). William Hopwood. Ills. Read before Natl. Assn. of Col. Mgrs. 3000 w. Ir & Cl Trds Rev—March 29, 1918. Details of work.

Methods

Incline Top-Slicing Method (82505 D). W. G. Scott. Ills. 10 pp. A I M E, Bul—Nov., 1917. Suggestions for the application of the Coronado method to ore bodies of larger size.

American Notes (83842 N). Samuel Dean, with discussion. 27 pp. Instn Min Engrs, Trans—Dec., 1917. Methods of increasing production, comparisons; management, etc.

Branch Raise System at the Ruth Mine, Nevada Consolidated Copper Co. (83871 D). Walter S. Larsh. Ills. 1500 w. A I M E, Bul—Jan., 1918. Details of development.

The Ore-Mining Method Used at the Raimund Division, Birmingham District, Alabama (84430 N). Gerald G. Dobbs. Ills. 17 pp. L S Min Inst, Pro—1917. Location, description and methods of mining.

Methods of Mining at the Chapin Mine (84418 N). W. C. Gordon. 16 pp. L S Min Inst, Pro—1917. Brief description of the geology and methods of mining.

Methods of Mining in Crowsnest Pass District, Alberta (84520 N). Raoul Green. Ills. 2200 w. Can Min Inst, Trans—1917. Systems depending on the geological and physical features.

Mining Methods at the Magpie Iron Mine (84517 N). A. Hasselbring. Ills. 2000 w. Can Min Inst, Trans—1917. Siderite, in Ontario, mined and made into merchantable ore by roasting.

Mining Methods in the Iron River District of Michigan (84419 N). Rudolph Ericson. 2500 w. L S Min Inst, Pro—1917. Brief account of methods at the various mines.

Mine Air

The Estimation of Injurious Dust in Mine Air by the Kotzé Konimeter (86712 N). John Innes, with discussion. Plates. 11 pp. Chem, Met, & Min Soc of S Af—March, 1918. Advantages over other methods of dust sampling, giving results of experiments and experience.

MINE OPERATION

Mine Management

Mine Buildings

Pisé de Terre Mine Buildings (89273 A). 1500 w. Eng & Min JI—Oct. 5, 1918. Details of a method of construction of buildings in mining camps, by means of rammed earth.

Mine Cafeteria

The Cafeteria at the Kerr Lake Mine (86526). H. E. Kee. Ills. 1200 w. Eng & Min JI—May 25, 1918. The system and its operation, with advantages.

Mine Cars

An Automatic Drop-Bottom Mine Car (83074 A). Ills. 1200 w. Engr—Nov. 23, 1917. Detailed description of the Griffith tub, made at Knoxville, Tenn.

Mine Dust

Dust Prevention in Transvaal Mines (88149 A). Arthur C. Whitcomb and J. H. Veasey. Exerpt from paper before So. Af. Inst. of Engrs. 5500 w. Eng & Min JI—Aug. 10, 1918. Review of Methods used for allaying dust and improving ventilation.

Mine Efficiency

Increasing Coal Mine Efficiency—I (89,604). Charles E. Stuart. Charts. 2500 w. Cl Age—Oct. 17, 1918. Serial, 1st part. Problems of the power generation and distribution system.

Mine Fans

Origin and Development of the Ventilating Fan (89471). 2200 w. Cl Age—Oct. 10, 1918. Types in use and advantages of steel-plate faces.

Mine Fire

Mine Fire at Utah-Apex Mine (87494 A). V. S. Rood and J. A. Norden. Ills. 3000 w. Sfty Eng—June, 1918. Conditions during and after the fire.

Engineering Problems Encountered During Recent Mine Fire at Utah Apex Mine, Bingham Canyon, Utah (85602 A). V. S. Rood. Ills. 15 pp. Utah Soc Engrs, Mthly JI—Feb., 1918. Conditions before the fire, during the fire, and after, with account of expenses incurred.

Engineering Problems During Mine Fire at Utah-Apex Mine, Bingham Canyon, Utah (86911 D). V. S. Rood and J. A. Norden. Ills. 11 pp. A I M E, Bul—June, 1918. Conditions before the fire, during the fire, and afterward.

Mine Gas

Testing for Gas in Mines (87951). H. E. Gray. Ills. 1800 w. Cl Age—Aug. 1, 1918. Important features of a good testing lamp, and the value of the sight indicator.

Mine Hoists

Drum Shapes as Affecting the Mine Hoist Duty Cycle and Motor Rating (89,

412 D). F. L. Stone. Ills. 18 pp. A I E E, Pro—Oct., 1918. Standardization considered impossible.

Mine Lamps

Approved Electric Lamps for Miners (82590 A). H. H. Clark and L. C. Ilsley. Ills. 50 pp. U S Bur Mines—Bul. 131. Describes development of a number of types that meet requirements and discusses features and qualities.

Advantages in Use of Permissible Electric Lamps in Non-Gaseous Mines (89,219 A). George H. Deike. 1800 w. Sfty Eng—Oct., 1918. Characteristics of a non-gaseous mine; reasons for success of electric cap lamps.

The Chance Acetylene Safety Lamp (89529 A). William Maurice. Ills. 2200 w. Colly Gdn—Sept. 27, 1918. Describes a new lamp and gives information concerning its efficiency.

Mining Law

New Mining Law of Portugal (87174). George Warren Tower, Jr. 1200 w. Min & Sci Pr—June 22, 1918. The law is substantially that of a leasing system.

Mining Supplies

Purchase of Mining Machinery and Supplies (89652). C. E. Bowron. 2200 w. Cl Age—Oct. 24, 1918. Suggestions for judicious purchase.

Mine Lights

Electric Lamps in Nongaseous Mines (84059). George H. Deike. Abstract of paper before the Natl. Safety Council. 2200 w. Cl Age—Feb. 2, 1918. Reasons why electric lamps are safer for all mines.

Mine Locomotives

Advantages of Storage-Battery Locomotives (88638). C. W. Chappelle, with discussion. Read before Illinois Min. Inst. Ills. 6500 w. Cl Age—Sept. 5, 1918. Merits as applied to the gathering of coal in mines.

A New Type of Mine Locomotive Controller (88679 A). L. W. Webb. Ills. 900 w. Gen Elec Rev—Sept., 1918. Developed for service on large mine locomotives.

Determination of the Proper Size of Storage-Battery Locomotive (89022). Dever C. Ashmead. 2200 w. Cl Age—Sept. 19, 1918. Drawbar pull and battery capacity govern the selection. Method of determining these factors explained.

Mine Management

The Commonsense of Mine Management (82911). Henry M. Adkinson. 3000 w. Eng & Min JI—Dec. 8, 1917. Modern business methods as applied.

MINE OPERATION

Mining Policies

Mine Plant

New Plant of Pioneer Operations in Franklin County, Illinois (88070). George W. Harris. 2800 w. *CI Age*—Aug. 8, 1918. Reviews development of this field.

Mine Power

See same heading under **ELECTRICAL ENGINEERING, Power Applications.**

Economy of Electricity Over Steam for Power Purposes In and About Mines (84340 D). R. E. Hobart. Ills. 2500 w. *A I M E*, Bul—Feb., 1918. Tests show saving by electrification.

Mining Electrical Engineering (88592 A). Chris. Jones. Abstract of article in *Pro. S. Wales Inst. of Engrs.* Ills. 2500 w. *Elec Rev*—Aug. 9, 1918. Serial, 1st part. A consideration of the electrical system.

Reconstruction of Hydraulic-Power Canal for Ecuador Gold Mine (82347). Paul C. Schrap. Ills. 3500 w. *Eng & Min JI*—Nov. 10, 1917. Details of construction of a new concrete canal delivering water to Pelton wheels at the S. A. Development Co.'s properties in Ecuador.

Mines Report

Gold, Silver, Copper, Lead, and Zinc in Idaho and Washington in 1916 (86,024 N). C. N. Gerry. 65 pp. *U S Geol Surv*, I:18—March 14, 1918. Production, value, etc.

Mine Shops

Coal Mine Shop Equipment (82214). R. M. Magraw. Ills. 3500 w. *CI Age*—Nov. 3, 1917. Advocates facilities for making repairs promptly as needed.

Mine Signalling

Signalling System of Bengal Mine, Palatka, Michigan (84428 N). A. H. MacGregor. Ills. 10 pp. *L S Min Inst*, *Pro*—1917. Requirements, with details of system and its working.

Mine Supports

The Use of Concrete for Mine Supports (85261 A). George Knox. Ills. 3500 w. *Colly Gdn*—March 8, 1918. A memorandum prepared for the Board of the South Wales and Monmouthshire School of Mines.

Mine Valuation

Valuation of Mines in Arizona (89,488 A). E. Jacobs. 1800 w. *Eng & Min JI*—Oct. 12, 1918. Describes the Arizona method of classifying mines.

The Valuation of Ore Reserves (89,196 A). James Whitehouse. Ills. 1700 w. *Colly Gdn*—Sept. 13, 1918. Serial, 1st part. Outlines methods used on the Witwatersrand, and describes in detail the method of sampling the gold-bearing reefs.

Mine Taxation

The Taxation, Rating and Valuation of Mines (86378 A). David Bowen, with discussion. Abstract of paper read before the Surveyors' Instn. 7800 w. *Ir & CI Trds Rev*—March 1, 1918. Principles of taxation and taxing systems.

Mine Telephones

The Operation of Magneto Telephones in Series to Avoid Gas Ignition in Mines (82842 A). L. Fokes. Ills. 1200 w. *Ir & CI Trds Rev*—Nov. 16, 1917. Mining telephones, their operation and installation.

Mine Ventilation

See same heading under **MECHANICAL ENGINEERING, Heating and Cooling.**

Mine Water

Handling Mine Water (88072). Henry E. Cole. Ills. 2200 w. *CI Age*—Aug. 8, 1918. The points to be considered before selecting a pump.

Mine Workers

The Human Side of Mining Engineering (89406 N). James Furman Kemp. 10 pp. *Univ Mo*, Bul—June, 1918. Commencement address, May 24, 1918. Ways in which loyalty of workers to the company or firm may be secured.

Mining Industry

The Saloon Evil in the Mining Industry (82991). 2500 w. *CI Age*—Dec. 15, 1917. Effect on coal production.

Mining in 1917

Mining in Utah in 1917. Edward R. Zalinski; in Colorado. George E. Collins; in Idaho. Robert N. Bell (83734). 8 pp. *Eng & Min JI*—Jan. 19, 1918. Reviews.

Mining Machines

Notes on Operating Mining Machines (87410 A). M. Dempster. Ills. 3000 w. *Ir & CI Trds Rev*—June 7, 1918. Read before E. of Scot. Br. of Assn. of Min. Elec. Engrs. The actual work of operating coal-cutters.

Mining Methods

Squeeze in the Maxwell Shaft (82,090). D. C. Ashmead. Ills. 1800 w. *CI Age*—Dec. 15, 1917. Details of plan for reconstructing the timbering.

Mining Methods at Chapin Mine, Michigan (82912). W. C. Gordon. Read at meeting of L. Superior Min. Inst. 4000 w. *Eng & Min JI*—Dec. 8, 1917. Combined top-slicing and sub-level caving.

Mining Policies

Should Mining Companies Expand? (86077). P. B. McDonald. 1800 w. *Min & Sci Pr*—May 4, 1918. Policies pursued by different companies.

MINE OPERATION

Shafts

Oklahoma

Mining and Milling in the Miami Field of Oklahoma (88158 D). Edgar Z. Wal-lower. 1200 w. Okla Soc Engrs, Trans—Vol. IV, 1918. Features of interest in the mining and milling of lead and zinc. Ore Car

Ore Car Designed at Hecla Mine (88962 A). C. T. Rice. Ills. 1800 w. Eng & Min JI—Sept. 21, 1918. Construction details of a mine car of 82 cu. ft. capacity.

Ore Storage

Yard and Bins for Large Ore Storage Plant (82579 A). Ills. 1000 w. Iron Age—Nov. 22, 1917. Plant at Youngs-town, Ohio.

Pillars

Method of Mining Pillars at the Fortuna Mine of the Braden Copper Co., Chile (88797 A). Charles Hollister. Ills. 1200 w. Eng & Min JI—Sept. 14, 1918. Methods of breaking and supporting the ground.

Drawing Pillars in Metal Mines (85221). W. R. Crane. Ills. 2000 w. Min & Sci Pr—March 23, 1918. Discusses only successful methods.

Pit Props

The Strength of Pit Props (84833 A). F. L. Booth. 1500 w. Colly Gdn—Feb. 15, 1918. Read before N. of Eng. Inst. of Min. & Mech. Engrs. Tabulated results of tests of crushing strengths of various sizes.

Pit Rails

Choosing and Laying Pit Rails (84433 A). From *Glückauf*. Ills. 2800 w. Colly Gdn—Feb. 1, 1918. Considers rails, sleepers, laying, switches and turntables.

Power Plants

Mine Plant Saves Forty-five Tons of Coal Per Day (84541). Ills. 1000 w. Power—Feb. 26, 1918. Installation of a new boiler plant reduces fuel consumption and increases mine capacity.

The Logan, West Virginia, Power Plant (83037). Ills. 1800 w. Power—Dec. 18, 1917. An up-to-date small capacity plant furnishing power and light to mines.

Pumping Engines

Two Newcomen Atmospheric Pumping Engines (88392 A). Gerald T. Newbould. Ills. 2000 w. Colly Gdn—Aug. 2, 1918. Describes the Westfield engine and the Elsecar engine. Two of the oldest engines.

Quarries

Establishing a Municipal Stone Quarry (84130 N). Arthur Farrer. Ills. 1500 w. Comwh Engr—Jan., 1918. Experiences in establishing a municipal quarry and stone-breaking plant for road-making purposes in Ballarat, Australia.

French Quarries Inspected by U. S. Engineers (84619). Robert K. Tomlin, Jr. Ills. 900 w. Eng News-Rec—Feb. 28, 1918. Hand labor the prevailing method of operation.

Quarrying

War Time Quarrying in the High Peak (83745 A). Ills. 2500 w. Quarry—Jan., 1918. Quarries of the Buxton Lime Firms worked by women.

Reports

The Standardization of Directors' Reports for Mining Companies (86071). T. O. McGrath. 2500 w. Eng & Min JI—May 4, 1918. Plea for uniformity in reports of directors to stockholders of mining companies.

Russia

Mining Laws for Russia (83489). Horace V. Winchell. 1500 w. Min & Sci Pr—Jan. 5, 1918. General principles suggested to Ministry of Commerce & Industry.

Safety Lamps

Approved Safety Lamps (86703 A). Ills. 4000 w. Colly Gdn—May 3, 1918. Gives the safety lamps order of the 9th of March, 1918.

Notes on Safety Lamp Installation at Plennmeller Colliery, Haltwhistle, Northumberland (87884 A). George Raw, with discussion. 2500 w. Ir & Cl Trds Rev—May 31, 1918. Reason for favoring the electric safety lamp.

Sandfilling

Further Notes on Sandfilling of Mines (87795 N). C. H. Greathead. Ills. 2000 w. Chem, Met & Min Soc of S Af, JI—April, 1918. Minor alterations.

Shaft Lining

Relining a 20-Ft. Diameter Shaft (84-256 A). G. B. Tristram. Ills. 2000 w. Ir & Cl Trds Rev—Jan. 25, 1918. Details of the work.

Shafts

Shaft Sinking at the Seneca Mine (89-179 A). W. V. Featherly. Ills. 1000 w. Eng & Min JI—Sept. 28, 1918. Record established at Mohawk, Mich.

Shaft for Water Hoisting and Ventilation (88475). Ills. 2200 w. Cl Age—Aug. 29, 1918. Details of combination.

Steel Guides in Shafts (88254 N). James Whitehouse, with short discussion. Ills & Plate. 2500 w. So Af Instn Engrs, JI—June, 1918. Results obtained by use of slotted steel guides in deep-level mines.

The Repair of a Circular Shaft of Small Diameter (88372 N). Stewart Chambers. Plate. 6 pp. Instn Min Engrs, Trans—July, 1918. Describes conditions.

Shaft Pillars

MINE OPERATION

Tunnels

Notes on Shaft Relining With Concrete (87422). G. G. Stonemark. 3000 w. Eng & Min JI—July 6, 1918. Methods used in relining two shafts on the Mesabi range.

Repairing a Small Circular Shaft (87357 A). S. Chambers. Ills. 2500 w. Colly Gdn—June 14, 1918. From paper read before the Min. Inst. of Scotland. Describes work at a colliery near Bristol.

Modern Methods of Shaft Sinking (85695 A). W. H. Maxwell. Ills. 2500 w. Colly Gdn—March 28, 1918. Serial, 1st part. Sinking by hand, and the Kind—Chaudron system are considered in the present number.

The Cementation Process of Shaft Sinking (85826 N). E. H. Robertson, with discussion. 3 plates. 4000 w. Min & Geol Inst of India, Trans—Nov., 1917. Describes examples of the application of this process.

Equipping and Sinking the No. 1 Shaft at the Holmes Mine (84424 N). Lucien Eaton. Ills. 18 pp. L S Min Inst, Pro—1917. Detailed description.

New Shaft at Kirkby Colliery (83639 A). Ills. 1800 w. Ir & Cl Tds Rev—Dec. 31, 1917. Detailed description.

Fireproofing Mine Shafts of the Anaconda Copper Mining Co (84964 D). E. M. Norris. 1000 w. A I M E, Bul—March, 1918. Account of concrete applied with cement gun.

Stripping and Re-lining a Shaft at Cowdenbeath, Fife (84834 A). Henry Rowan. 1500 w. Colly Gdn—Feb. 15, 1918. From paper before Min. Inst. of Scotland. Details of the work. Employment of Divers in Shaft Sinking (82548 A). H. Grahn, in Glückauf. Ills. 2200 w. Colly Gdn—Nov. 2, 1917. Operations performed by divers.

Shaft Pillars

Notes on the Removal of a Vertical Shaft Pillar (88589 N). J. Chilton, with remarks. Ills. 3000 w. Chem, Met & Min Soc S Af, JI—June, 1918. Discussion of the problem, with explanation.

Shaft Signals

A "Responsive" Shaft Signal Device (85181 N). B. Angwin. Ills. 800 w. Instn Min & Met, Bul 161—Feb. 28, 1918. Illustrated description.

Shift Boss

Qualifications and Duties of a Shift Boss (84467). 2000 w. Eng & Min JI—Feb. 23, 1918. Address by Joseph P. Hodgson to mine foremen and department heads of the Copper Queen mines.

South Africa

State Operation of Mines in South Africa (82518). A. Cooper Key. 2500 w. Eng & Min JI—Nov. 17, 1917. Excerpts from the majority report of the Commission of State Mining of South Africa. Unfavorable to general mining. Possible exception of diamond mining.

"Square Set"

Notas Sobre El Empleo Del "Square Set" En La Explotacion De Las Minas (85865 D). L. C. Espinosa. Ills. 3900 w. Boletin Minero—Oct., 1917. Suggestions for use of the "Square Set" in mining operations.

Mining

Mining in the North-West (83726). Francis A. Thomson. 1500 w. Min & Sci Pr—Jan. 19, 1918. Labor supply; smelting and transportation facilities.

Steam Shovel

Steam-Shovel Mining on the Mesabi Range (84711). L. D. Davenport. Ills. 3000 w. Eng & Min JI—March 2, 1918. Serial, 1st part. Present practice of the larger companies in open-pit mining.

Stoping

Stoping to Branched Raises (84429 N). F. W. Sperr. Ills. 1500 w. L S Min Inst, Pro—1917. Explains use of branched raises for sublevel stoping.

Strip Mining

Strip Mining Where Bad Roof Prevails (85752). Ralph W. Mayer. 2500 w. Cl Age—April 20, 1918. Coal in Pittsburgh region being recovered profitably by means of stripping. Plan and methods of working.

Substation

Large Underground Synchronous Substation (88637). R. P. Hines. Ills. 1500 w. Cl Age—Sept. 5, 1918. A transforming and converting station underground which has given satisfaction.

Timbering

Timbering in Mines (88857 A). S. Evans, with discussion. Paper at Midland Branch of the N. A. C. M. Ills. 4500 w. Ir & Cl Trds Rev—Aug. 16, 1918. Methods for preserving and protecting timber in mines as it is scarce and expensive.

Tipples

Simpson Creek Coal Co.'s Tipples (88636). R. G. Read. Ills. 1100 w. Cl Age—Sept. 5, 1918. Novel features in the design. Coal coming down the mountain side generates power.

Tunnels

Tunnel-Blasting at Chuquicamata (89025 A). E. E. Barker. Ills. 4500 w. West Eng—Sept., 1918. Tunnels are driven under a bank 150 ft. high and loaded with dynamite and black powder. Results and cost.

Ventilation

Driving Operations of the Spiro Tunnel of the Silver King Consolidated (83034). Murray Schick. Ills. 1000 w. Eng & Min J1—Dec. 15, 1917. Account of the 14,000 ft. drainage tunnel in Utah.

Ventilation

Canvas Tubing for Mine Ventilation (83870 D). L. D. Frink. Ills. 2500 w. A I M E, Bul—Jan., 1918. Explains its use at Butte, Mont.

MINES AND DISTRICTS**California****Winding Engines**

Overwinding and Controlling Devices for Winding Engines (84992 N). H. Newberry, with discussion. 8 pp. Instn E E, Trans—Nov., 1917. Brief description of scheme installed.

Yukon

Further Notes on Yukon Mining Problems (84510 N). Henry M. Payne. Ills. 19 pp. Can Min Inst, Trans—1917. Thawing methods and results.

MINES AND DISTRICTS**Alaska**

Mining in Alaska Under War Conditions (89272 A). P. C. Stoess. 4000 w. Eng & Min J1—Oct. 5, 1918. How present economic conditions are affecting the mining industry. Gloomy outlook.

Notes on Mining in Alaska (89676 A). C. Carleton Semple. 4500 w. Eng & Min J1—Oct. 26, 1918. Résumé of mining conditions and synopsis of the present operations of important companies.

Mining Developments and Water-Power Investigations in South-eastern Alaska (83641 N). Theodore Chapin, H. M. Eakin, and G. H. Canfield. Maps. 90 pp. U S Geol Surv—Bul 662-B. Account of mining operations and water-power investigations.

Gold, Silver, Copper, and Lead in Alaska in 1916 (82688 N). Alfred H. Brooks. 16 pp. U S Geol Surv, I: 6—Nov. 20, 1917. Production, with review by regions.

The Alaskan Mining Industry in 1916 (82534 N). Alfred H. Brooks. Ills. & Maps. 62 pp. U S Geol Surv—Bul. 662-A. Results achieved during the year.

Alsace-Lorraine

La Valeur Économique De L'Alsace-Lorraine (87123 B). L. De Launay. 4500 w. La Nature—May 4, 1918. Economic importance of Alsace-Lorraine; its coal and iron industry; oil and potash; textile mills, etc.

Arizona

Gold, Silver, Copper, Lead and Zinc in Arizona in 1916 (83650 N). V. C. Heikes. 37 pp. U S Geol Surv, I: 10—Dec. 21, 1917. Mines report of production by counties.

Brazil

Iron and Steel in Brazil (88422). 1100 w. Times Engng Supp—July, 1918. How the iron industry is being encouraged.

British Columbia

Summary Review of Mining in British Columbia During 1917 (83891 N). E. Jacobs. 1500 w. Can Min Inst, Bul—Jan., 1918.

British Empire

The Development of the Mineral Resources of the British Empire (84820 A). William Frecheville, with discussion. Maps. 10 pp. Roy Soc Arts, J1—Feb. 22, 1918. Suggestions for development.

California

Mines and Mineral Resources of the Counties of Monterey, San Benito, San Luis Obispo, Santa Barbara, and Ventura (82491 N). Walter W. Bradley, Emile Huguenin, C. A. Logan, and Clarence A. Waring. Maps & Ills. 175 pp. Calif State Min Bur—Dec., 1916. Developed and undeveloped resources.

Mines and Mineral Resources of San Bernardino County, and Tulare County (82490 N). H. C. Cloudman, Emile Huguenin, F. J. H. Merrill and W. Burling Tucker. Ills. 180 pp. Calif State Min Bur—Dec., 1916. Reports of active and promising properties.

Mines and Mineral Resources of Alpine County, Inyo County, Mono County (82489 N). Arthur S. Eakle, Emile Huguenin, R. P. McLaughlin, and Clarence A. Waring. Ills. 170 pp. Calif State Min Bur—Dec., 1916. Mining under difficulties.

Mines and Mineral Resources of Los Angeles County, Orange County, Riverside County (82488 N). Frederick J. H. Merrill. Ills. 127 pp. Calif State Min Bur—Dec., 1916. Important producers of structural materials and petroleum.

Mines and Mineral Resources of the Counties of El Dorado, Placer, Sacramento, Yuba (92487 N). W. Burling Tucker and Clarence A. Waring. Maps & Ills. 188 pp. Calif State Min Bur—Dec., 1916. Directing of mines in these counties.

Calumet and Hecla**MINES AND DISTRICTS****Kalgoorlie**

Mines and Mineral Resources of the Counties of Butte, Lassen, Modoc, Sutter, and Tehama (82486 N). W. Burling Tucker and Clarence A. Waring. Ills. 86 pp. Calif State Min Bur—Dec., 1916. Mineral properties both active and prospective.

The Calico District, California (86633). Leroy A. Palmer. 3000 w. Ills. Min & Sci Pr—June 1, 1918. An abandoned district, formerly famous for its silver; deposits of borate; silver possibilities.

California Mineral Production for 1916 (83221 N). Walter W. Bradley. With county maps and Ills. 170 pp. Calif State Min'g Bur, Bul 74—Aug., 1917. Statistics.

Calumet and Hecla

Notes on the Calumet & Hecla Mine Fire (84426 N). John Knox, Jr. 6 pp. L S Min Inst, Pro—1917. Account of the fire and conditions in connection.

The Founding of the Calumet & Hecla Mine, 1866–1916 (84421 N). 3000 w. L S Min Inst, Pro—1917. Early history of this mine.

Canada

Annual Report on the Mineral Production of Canada During the Calendar Year 1916 (88256 N). John McLeish. 235 pp. Can Dept Mines—No. 474. Statistical.

Summary Report of the Mines Branch of the Department of Mines for the Calendar Year Ending December 31, 1916 (84471 N). Can Dept Mines—No. 454.

The Fuels and Waterpowers of Canada. A Consideration of their Proper Spheres of Usefulness (84537). A. S. L. Barnes. 3000 w. Can Engr—Feb. 21, 1918. Fundamental principles for their conservation and use.

Canada—The Treasury of Her Mines (84746). Ills. 3000 w. Can Fndman—Feb., 1918. Serial, 1st part. Review of the mineral resources.

Preliminary Report on the Mineral Production of Canada During the Calendar Year 1917 (84874). John McLeish. 18 pp. Can Dept Mines, No. 478—Feb. 26, 1918.

The Production of Copper, Gold, Lead, Nickel, Silver, Zinc, and Other Metals in Canada During the Calendar Year 1916 (85268 N). 75 pp. Can Dept Mines—No. 471. Advance chapter of the annual report.

Canadian Metallurgy

Recent Advances in Canadian Metallurgy (86320). Alfred Stansfield. Read before Can. Soc. of Civ. Engrs. 4000 w. Can Fndman—May, 1918. Developments induced by war's demands.

Colorado

Colorado Metal Production in 1917 (83624). Maps. 1500 w. Min & Sci Pr—Jan. 12, 1918. Output of gold, silver, copper, lead and zinc.

Mining in the Telluride District of Colorado (88523 A). Harry J. Wolf. Ills. 3500 w. Eng & Min Jl—Aug. 31, 1918. Brief history, climatic conditions, class of deposits, and mining characteristics.

Copper River

Mining in the Lower Copper River Basin (86791). F. H. Moffit. Maps. 3500 w. Min & Sci Pr—June 8, 1918. Abstract from Bul 662-C. U. S. Geol. Surv. Deals with Kennecott-Bonanza, Jumbo, and Erie mines.

Cuba

Nuestra Excursion a Matahambre (88-408 A). J. I. Del Corral. Ills. 11,500 w. Rev Soc Cubana De Ingenieros—July, 1918. Copper mines at Matahambre, in Pinar del Rio.

Dargalong

Dargalong Silver-Lead Mines, near Chillagoe, North Queensland (83636 N). Lionel C. Ball. Ills. 8000 w. Qnsd Gov Min Jl—Dec., 1917. History, production, geology, holdings, etc.

Death Valley

The Sink of the Amargosa (86643). George J. Young. Ills. 1200 w. Eng & Min Jl—June 1, 1918. Death Valley described. The saline deposits.

East Indies

Ontdekking van belangrijke delfstofafzettingen in Ned.-Indië (85854 B). E. C. Abenanon. Ills. 4500 w. Ingenieur—Feb. 16, 1918. Important discovery of iron and nickel ores in Celebes (Dutch East Indies). Methods of working, estimated extent, etc.

Idaho

Mining Districts of Northern Idaho (83879). E. K. Soper. Map. 6000 w. Min & Sci Pr—Jan. 26, 1918. Geology the Cœur d'Alene region.

Jerome

Petrographic Notes on the Ore Deposits of Jerome, Ariz. (88774 D). Marion Rice. Ills. 6 pp. A I M E, Bul—Sept., 1918. Notes on this important copper-mining district.

Kalgoorlie

The Effect of the Cost of Water on Metallurgical Progress at Kalgoorlie (82812 N). Thomas B. Stevens. 1200 w. Cham Mines W Aust, Mthly Jl—Aug. 31, 1917. Ways in which the cost of water affects the profits.

MINES AND DISTRICTS

Rand

Mackenzie River

The Mackenzie River Basin (82938). Gerald M. Ponton. Ills. 2500 w. Can Min JI—Dec. 1, 1917. The Canadian northwest, its possibilities, resources, etc.

Manitoba

Mining in Northern Manitoba (89617 A). J. A. Campbell. Ills. 2000 w. Eng & Min JI—Oct. 19, 1918. History of the region and details of its development.

Mineral Industry

The Mineral Industry After the War (86295 N). Alfred W. G. Wilson. 2000 w. Can Min Inst, Bul—May, 1918. Second excerpt from paper before C. M. I. Principal methods by which increased national revenue may be obtained from this industry.

Mine Conditions

Earth Movements and Underground Conditions in Mines (88718 N). A. Montgomery. 7000 w. Cham Mines W Aust, Mthly JI—May 31, 1918. State mining engineer's report on general conditions of underground work in Australia.

Mine Surveying

The Future Aspect of Mine Surveying (87974 A). John Proctor. 3500 w. Colly Gdn—July 19, 1918. Shows inaccuracies in mine surveying.

Mine Valuation

Formulas for Mine Valuation (86396). W. W. Whitton. 3500 w. Min & Sci Pr—May 18, 1918. Deduction of the Hoskold formula for valuation. Importance of new formulæ.

Nova Scotia

Nova Scotia Production and Its Relation to the War (88874 N). F. E. Lucas. 1500 w. Can Min Inst, Bul—Sept., 1918. The materials contributed for war purposes, and the value of raw materials.

Oklahoma

Lead and Zinc Rival Crude Oil as Fortune Builders in Oklahoma (82580). C. M. Sarchet. 1200 w. Mfrs' Rec—Nov. 22, 1917. Report of production and interesting features of this district.

Ontario

Mineral Production of Ontario, 1917 (85459). T. W. Gibson. 2500 w. Can Min JI—April 1, 1918. Reports concerning gold, silver, nickel and copper, iron, etc.

Philippines

The Mineral Resources of the Philippine Islands for the Year 1916 (86421 N). Ills. 25 pp. Phil Bur Sci—1917. Includes Mineral Resources by Alvin J. Cox; Metal Mining and Coal Mining by V. E. Lednicky. Manufacture of Roof-

ing Tiles; and the Rizal Cement Plant, by J. C. Witt.

Pillars

Method of Mining Pillars at the Fortuna Mine of the Braden Copper Co., Chile (88797 A). Charles Hollister. Ills. 1200 w. Eng & Min JI—Sept. 14, 1918. Methods of breaking and supporting the ground.

Portugal

The Mineral Industry of Portugal (87528). Frederick W. Foote and Rastus S. Ransom, Jr. Ills. & Map. 5000 w. Eng & Min JI—July 13, 1918. Résumé of mineral activities, with some production figures and details of working conditions.

Quebec

Mineral Production of Quebec, 1917 (85460). Theodore C. Denis. 900 w. Can Min JI—April 1, 1918. Increase in value of output. Asbestos, copper and sulphur ore, zinc and lead ore, chromite, etc.

Report on Mining Operations in the Province of Quebec During the Year 1917 (88709 N). Maps & Ills. 140 pp. Dept. Colonization, Mines & Fisheries—1918. Statistical tables and review.

Queensland

Queensland Mines Inspection (87788 N). C. F. V. Jackson. 3500 w. Qnsd Gov Min JI—June, 1918. Extracts from mining engineer's report for 1917. Deals with labor, wages, accidents, ventilation.

The Mining Industry of Queensland (87787 N). A. J. Jones. 5500 w. Qnsd Gov Min JI—June, 1918. Address by the minister for mines on the more important minerals and their development.

Queensland Mining Industry (86033 N). Map. 18 pp. Qnsd Gov Min JI—March, 1918. Review of the year 1917 by the under secretary for mines.

Silver Spur Mine (86576 N). Lionel C. Ball. Ills. 8500 w. Qnsd Gov Min JI—April, 1918. Recent developments and future prospecting. History, geology, ore deposits, etc.

Rand

The Survey Office on the Rand (87530). E. M. Weston. 2500 w. Eng & Min JI—July 13, 1918. Work of the mine surveyor in controlling stoping operations.

Presidential Address (86809 N). Hugh F. Marriott. 21 pp. Instn Min & Met, Bul 163—April 25, 1918. Points in the history of the Rand not found in other records.

MINOR MINERALS

Barytes

Russia

Mining in Russia After the War (82-810 A). Eugene De Houtpick. 2000 w. Aust Min Stand—Nov. 1, 1917. Serial, 1st part. Social and economic aspects due to the war and the revolution.

L'Industria Minière Et Siderurgique De La Russie (86494 E). A. Gowry. 20,000 w. Mem Soc Ingénieurs De France—Oct.-Dec., 1917. Mineral and metallurgical industry of Russia in 1913, and its possible future development.

Santa Rosalia

Negociacion Minera "El Boleo" (85-864 D). Ills. 1700 w. Boletín Minero—Nov., 1917. The development of "El Boleo" copper property at Santa Rosalia, Bay of California.

South Africa

Mineral Production of South Africa in 1917 (86746). A. Cooper Key. 1500 w. Eng & Min Jl—June 8, 1918. Effects of war conditions. Profits in general decreased.

The Industrial Resources of the Union of South Africa (84819 A). C. du Plessis Chiappini, with discussion. 16 pp. Roy Soc Arts, Jl—Feb. 15, 1918. Review of

the industries and the problems of the present and future.

Southern U. S.

The South's Share in Furnishing War-Making Minerals (85550). Franklin K. Lane. 1000 w. Mfrs' Rec—April 11, 1918. Some of the useful minerals are iron pyrites, sulphur, manganese, flake graphite, mica, corundum, etc.

Spitzbergen

Spitzbergen and Its Resources (83-129 A). 1200 w. Map. Engrg—Dec. 7, 1917. Information concerning the coal deposits.

Tasmania

The Bangor Mineral District (88169 N). W. H. Twelvetees. Ills. and Map. 17 pp. Tas Geol Surv Bul—No. 27. The locality, geology, slate quarrying, etc.

Tonopah

Effect of the War Upon Tonopah Mining (89271 A). Jay A. Carpenter. Ills. 2500 w. Eng & Min Jl—Oct. 5, 1918. Comparison of operating costs for the years 1913 and 1917 at Tonopah, Nev., silver mines.

Utah

Mining in Utah (83182). Benjamin F. Tibby. Ills. 2500 w. Min & Sci Pr.—Dec. 22, 1917. Coal, oil, metal mines, potash, etc.

MINOR MINERALS

Aluminum

Aluminum (Bauxite) Deposits and the Production of Aluminium (88844 A). 4500 w. Engng—Aug. 16, 1918. Serial, 1st part. A survey of known deposits and descriptions of the present development of processes of production.

Contributions to the Chemistry of Aluminium and Aluminium Alloys (88947 N). John G. A. Rhodin. 4400 w. Faraday Soc—July 23, 1918. A method of directly determining aluminium.

Metallography of Aluminium: Recrystallization and Grain-Growth—The Result of Deformation in the Cold Prior to Annealing (88948 N). Robert J. Anderson. Ills. 1500 w. Faraday Soc—July 23, 1918. Description of tests made on the annealing of cold-rolled aluminium sheet.

Annealing and Recrystallization of Cold-Rolled Aluminium Sheet (86301 A). Robert J. Anderson. Ills. 2500 w. Met & Chem Eng—May 15, 1918. Series of tests made on the effect of heat on the softening of cold-rolled sheet aluminium.

See Bauxite.

Alunite

Recently Recognized Alunite Deposits at Sulphur, Humboldt County, Nevada (87861 A). I. C. Clark. Ills. 3000 w. Eng & Min Jl—July 27, 1918. Important as a possible source of potash.

Antimony

Antimony in 1916 (87080). Edson S. Bastin. 6 pp. U S Geol Surv, I:22—June 14, 1918. Sources, uses, production, imports, prices, etc.

Production of Electrolytic Antimony from Impure Ores (82346). William A. Burr. Ills. 1500 w. Eng & Min Jl—Nov. 3, 1917. Details of method developed.

Barium Carbonate

Possible Sources of Barium Carbonate (86078). Samuel H. Dolbear. Ills. 800 w. Min & Sci Pr—May 4, 1918. Search for witherite; uses.

Barytes

South's Barytes Industry Expands 400 per cent. Making Nation Practically Independent (82305). James M. Hill. 3000 w. Mfrs' Rec—Nov. 8, 1917. Reviews the remarkable growth of the industry since 1913.

MINOR MINERALS

Gypsum

Bauxite

Bauxite and Aluminum in 1916 (82495 N). James M. Hill. 11 pp. U S Geol Surv, 1:5—Nov. 2, 1917. Production, prices, U. S. deposits, etc.

Bauxite in the South (83238). James M. Hill. 4000 w. Mfrs' Rec—Dec. 27, 1917. Occurrence and character, methods of mining, etc.

Bauxite in the Coastal Plain of Georgia (83486). Excerpts from report of H. K. Shearer. 4000 w. Eng & Min JI—Jan. 5, 1918. Describes the geology, character, size and distribution, the methods of mining and treatment.

Calcium

Calcium, Calcium Carbide and Calcium Cyanamide (86367 A). Ills. 5000 w. Aust Min Stan—April 11, 1918. Importance of the carbide industry, manufacture, etc.

Calcification

The Replacement of Wood by Calcite (85056 B). C. W. Greenland. Ills. 800 w. Econ Geol—March, 1918. Describes material collected near Russell, Kansas.

California

Manganese and Chromium (83104 N). E. S. Boalich. Ills. 22 pp. Calif State Min Bur—Sept., 1917. Preliminary report on deposits in California and their extent.

Carbonate Ores

Zinc Carbonate and Related Copper Carbonate Ores at Ophir, Utah (83649 N). G. F. Loughlin. Ills. 14 pp. U S Geol Surv, Bul 600A—Dec. 24, 1917. Occurrence, mineralogy, deposition, etc.

Mining and Concentration of Carnotite Ores (86232 A). Karl L. Kithil and John A. Davis. Ills. 80 pp. U S Bur Mines—Bul. 103. The mining of carnotite ores by the National Radium Institute; grinding and sampling of shipping ore before chemical treatment; concentration of milling ore; costs of production.

Chrome

Chrome Production and Distribution (85475). Samuel H. Dolbear. 2000 w. Eng & Min JI—April 6, 1918. Report on the condition of the chrome ore mining industry.

Chromite

Chrome-Ore Specifications and Producers of Chromite in California (84713). 2200 w. Eng & Min JI—March 2, 1918. List of producers and description of the largest Pacific Coast deposit.

Chromite in 1916 (82493 N). J. S. Diller. 17 pp. U S Geol Surv, 1:2—Oct. 26, 1917. Composition, production, prices, imports, etc.

Chromium

Chromium, Its Occurrence and Mining (82910). Excerpt from an article by Heinrich Ries. 1800 w. Eng & Min JI—Dec. 8, 1917. Sources of domestic and foreign supply, with table of comparative analyses of chromite ores.

Clay

Clay Resources of Southern Saskatchewan (88806). 1500 w. Can Engr—Sept. 12, 1918. Abundance of high-grade clays suitable for manufacture of stoneware, Rockingham wear, and white earthenware.

Report on the Clay Resources of Southern Saskatchewan (88257 N). N. B. Davis. Ills. 89 pp. Can Dept Mines—No. 468. Based on field work and laboratory tests.

Concentrates

Rare Metals Prices Question (85-951 A). 4000 w. Aust Min Stand—March 28, 1918. Australia molybdenum and tungsten concentrates. An explanation of the disabilities of concentrates producers from a technical, not a commercial, point of view.

Colorado

War Minerals of Colorado (88521 A). A. H. Hubbell. 2500 w. Eng & Min JI—Aug. 31, 1918. Important producer of the major metals, and for the output of tungsten and radium minerals.

Fertilizers

The Mineral Industries of the United States (84876). Part II. Fertilizers: An Interpretation of the Situation in the United States. Joseph E. Pogue. Ills. 20 pp. U S Natl Museum Bul 102, Part 2.

Fluorspar

Fluorspar Mining in Ontario (87040). Ills. 800 w. Can Min JI—June 15, 1918. Properties near Madoc, Ontario.

Graphite

Graphite in 1917 (87834). Henry G. Ferguson. 22 pp. U S Geol Surv, II:8—July 26, 1918. Uses, production, etc.

Gypsum

The Gypsum and Natural Whiting Deposits of Yorke Peninsula, South Australia (83249 N). 1200 w. Chem Eng & Min Rev—Nov., 1917. The deposits and workings.

The Gypsum and Natural Whiting Deposits of Yorke Peninsula, South Australia (83634 N). L. J. Winton. 1200 w. Chem Eng & Min Rev—Nov. 5, 1917. Report for half-year ending June 30, 1917.

Gypsum Products, Their Preparation and Uses (83793 A). R. W. Stone. Ills. & Map. 53 pp. U S Bur Mines—Tech paper 155. Methods of mining or quar-

Kelp

rying; equipment and operation of plants for reducing the crude rock to market products.

Kelp

The California Kelp Operations of the Hercules Powder Company (86655 A). Ills. 2200 w. Met & Chem Eng—June 1, 1918. An American industry developed as a result of a demand for acetone for use in munitions.

Kiln

The Deadburning of Magnesite and Dolomite (87345 A). E. Steiger. Ills. 600 w. Engng—May 31, 1918. Abstract of paper before the Ceramic Soc. Has reference to the Swiss economic kiln. Author's patent.

Magnesite

The Development of Canadian Magnesite (84513 N). Harold J. Roast, with discussion. Ills. 19 pp. Can Min Inst, Trans—1917. Deposits and manufactured products.

Magnesium

Development of the Magnesium Industry (89558 A). Leonard Waldo. 2000 w. Chem & Met Eng—Oct. 15, 1918. Its uses and the future outlook.

Magnesium (89383 A). 1000 w. Chem & Met Eng—Sept. 28, 1918. Some of its present commercial applications.

Magnesium—Its Properties, Manufacture and Uses (84526 N). J. C. King. 3000 w. Can Min Inst, Trans—1917. Summary of available information.

Manganese

Manganese (88711 N). M. A. Allen and G. M. Butler. 30 pp. Univ Ariz, Bul. 91—Aug., 1918. Information concerning manganese and its ores.

Manganese Deposits of East Tennessee (88910 N). G. W. Stose and F. C. Schrader. Ills. & Maps. 55 pp. Resources Tenn—July, 1918. Report of field work by geologists giving known deposits and descriptions of typical mines with suggestions.

Valuation of Manganese Ores (87257). 3800 w. Eng & Min JI—June 29, 1918. Notes from a paper by George T. Holloway, read some years ago before the Instn. of Min. & Met.

Magnesite Deposits of Washington (85624). R. W. Stone. Ills. 2500 w. Eng & Min JI—April 13, 1918. Production, history of development, deposits, etc.

The Utilization of Manganese Ores in Sweden (84249 A). Joh. Harden. 2500 w. Elec'n—Jan. 25, 1918. Methods of smelting; furnace types; methods of using the alloy, etc.

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The Arkansas Manganese Field (89,489 A). Dwight E. Woodbridge. 1200 w. Eng & Min JI—Oct. 12, 1918. Discusses the Batesville district.

Manganese in West Africa (83835 A). Stanley H. Ford. Ills. 1000 w. Min Mag—Dec., 1917. Recently discovered deposits now supplying English steel makers.

Undeveloped Manganese Ore Tracts in Shenandoah Valley, Virginia (83343). 1000 w. Mfrs Rec—Jan. 3, 1918. Information concerning deposits of promise.

Manganese Deposits of Clark County, Nevada (85966). Fred A. Hale, Jr. Ills. 1700 w. Eng & Min JI—April 27, 1918. Ore runs 40% and over in manganese and is low in phosphorus and iron.

Estimation of Manganese in Aluminum Alloys and Dust (84712). J. E. Ciennell. 4500 w. Eng & Min JI—March 2, 1918. Describes two methods which do not require its separation from all other constituents.

Greater Use of Domestic Manganese Supply (84918 A). F. Lynwood Garrison. 2500 w. Iron Age—March 14, 1918. Manganese ore output and needs.

Utilization of Manganese Ores in Sweden (83001 A). Joh. Harden. 3500 w. Met & Chem Eng—Dec. 15, 1917. Methods of smelting, furnace types, methods of using the alloy, etc.

Utilizing Domestic Manganese Supplies (82734 A). Edmund Newton. 2500 w. Iron Age—Nov. 29, 1917. Conserving manganese in basic open-hearth bath metal.

Marble

On the Occurrence of White Marble at South Ulam, Rockhampton District (83635 N). E. C. Saint-Smith. Ills. 4500 w. Qnsd Gov Min JI—Dec., 1917. Unlimited supplies of commercial quality in Queensland.

Mercury

Mercury Minerals in New Zealand (87488 N). Charles H. Holland. Map. 3000 w. Chem Eng & Min Rev—May, 1918. Describes deposits in several districts.

Mica

Mica in 1917 (88168). Waldemar T. Schaller. 12 pp. U S Geol Surv, II : 13—July 29, 1918. Production, prices, etc.

Minerals

The Situation in Regard to Manganese, Sulphur, Pyrite, and Some Other War Minerals (85188 B). J. E. Johnson, Jr., with discussion. 25 pp. Engrs' Soc W Penn, Pro—Jan., 1918. Causes that have produced the situation, and suggestions.

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Molybdenite

Simpson's Molybdenite Find (88765 N). Lionel C. Ball. Ills. 1800 w. Qnsd Gov Min J1—July 15, 1918. In the Connors Range, near Cardowan, Central Queensland. See also pp. 306, 316.

The Concentration and Marketing of Canadian Molybdenite (84505 N). H. H. Claudet, with discussion. 4500 w. Can Min Inst, Trans—1917. Film-flotation and other modern methods of treatment.

Molybdenite at Falcon Lake, Manitoba (82936). J. S. De Lury. Map. 1500 w. Can Min J1—Dec. 1, 1917. Information concerning the occurrences.

Molybdenum

Molybdenum (89118 N). William Poole. 4500 w. Qnsd Gov Min J1—Aug., 1918. Production, properties and uses.

Molybdenum in Norway (85788 N). Ernest R. Woakes. Map. 4000 w. Instn Min & Met, Bul 160—Jan. 10, 1918. The deposits, cost of mining, mines in operation, etc.

Molybdenum Mining at Climax, Colorado (86397). H. L. Brown and M. W. Hayward. Ills. 1500 w. Eng & Min J1—May 18, 1918. Deposits containing 1% molybdenum sulphide are being developed near Leadville.

Molybdenum Industry in Norway (85031). Map. 3500 w. Eng & Min J1—March 16, 1918. Excerpts from a paper by Ernest R. Woakes in Bull. 160 I. M. M. Facts regarding the present state of the industry.

Nickel

Nickel Industry of Canada (86836 N). 2500 w. Imp Inst, Bul—Oct.-Dec., 1917. Information from the latest report of the Royal Ontario Nickel Commission.

Nickel (83262). E. P. Mathewson. Address before Roy. Can. Inst., Toronto. 2500 w. Can Min J1—Dec. 15, 1917. Canada as a producer, its extraction, uses, etc.

The Metallurgy of Nickel (84365). F. H. Mason. 3500 w. Min & Sci Pr—Feb. 16, 1918. Abstract of report of the Royal Ontario Nickel Commission.

Canada's Nickel Industry (88066). 2500 w. Can Engr—July 12, 1918. Report of Royal Commission.

Nitrates

Determination of Nitrates in Caliche and Its Products (89487 A). J. E. Clennell. 2200 w. Eng & Min J1—Oct. 12, 1918. Methods in vogue in Chile. Results of a research to determine the accuracy.

The Chilean Nitrate Industry (85796 D). 1200 w. A I M E, Bul—April,

1918. Discussion of paper of Allen H. Rogers and Hugh R. Van Wagenen.

The Advent of Modern Mill Mechanism to Nitrate Leaching (86644). Donald F. Irvin. Ills. 3500 w. Eng & Min J1—June 1, 1918. The nitrate in Chile, with respect to the leaching of nitrates, by use of more advanced practice.

The Chilean Nitrate Industry (84357 D). Allen H. Rogers and Hugh R. Van Wagenen. Ills. 18 pp. A I M E, Bul—Feb., 1918. Its importance, deposits, origin of nitrate, mining and transportation methods, extraction plants, etc.

"Until Further Need Arises"—The Nitrate Problem (82197). Frank S. Washburn. 4000 w. Mfrs' Rec—Nov. 1, 1917. Reviews the situation in the United States and the recommendations of the late Committee on Nitrate Supply.

Phosphate

Acid Phosphate Now and After the War (89464). Charles A. Whittle. 1800 w. Mfrs' Rec—Oct. 10, 1918. Comparative values of rock phosphate and acid phosphate.

Potash

A Wet Process for Extracting Potash from Cement Dust (89363 A). J. G. Dean. Ills. 7500 w. Chem & Met Eng—Sept. 26, 1918. A humidifying process for precipitation of potash-bearing dust from cement kilns.

Extraction of Potash from Kelp (89361 A). C. A. Higgins. 2000 w. Chem & Met Eng—Sept. 26, 1918. Revival of the industry; old and new methods, etc.

Literature of the Potash Industry 1912-1917 (89364 A). F. W. Bruckmiller. 2500 w. Chem & Met Eng—Sept. 26, 1918. General review of more important articles published from 1912 to 1917.

Potash as a By-Product (89362 A). J. S. Grasty. Ills. 3000 w. Chem & Met Eng—Sept. 26, 1918. Southern iron ores and fluxes considered as a domestic source.

Potash from Alunite in Utah (89368 A). John W. Hornsey. 1500 w. Chem & Met Eng—Sept. 26, 1918. Deposits being worked in Utah; methods proposed for treatment, etc.

Potash in Nebraska (89560 A). J. M. Lliteras. Ills. 1800 w. Chem & Met Eng—Oct. 15, 1918. Reviews conditions at the plants producing potash from lake brines.

The Cottrell Process for Potash Recovery (89367 A). Linn Bradley. 4500 w. Chem & Met Eng—Sept. 26, 1918. Collection by electrical precipitation of vola-

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tile vapors of alkali salts from blast furnaces and cement kilns.

Potash from Searles Lake (89360 A). Alfred de Ropp, Jr. Ills. 3000 w. Chem & Met Eng—Sept. 26, 1918. Account of development of a project for the recovery of potash from the saline waters of a California lake.

The Kelp-Potash Plant of the Lorned Manufacturing Company (89365 A). Leslie H. Thompson. Ills. 2800 w. Chem & Met Eng—Sept. 26, 1918. An interview giving information of methods in California.

The Potash Industry of Germany (89366 A). Wallace Savage. Ills. 3000 w. Chem & Met Eng—Sept. 26, 1918. Theories of origin and description of the Strassfurt salts deposit; the present status of the industry.

Potash and Other Mineral Developments As Viewed by War Industries Board (88776). 2500 w. Mfrs Rec—Sept. 12, 1918. Letters from Bernard M. Baruch, T. Poole Maynard, and Charles Catlett, with remarks.

Potash as It Relates to War and Peace (88949). 2500 w. Mfrs Rec—Sept. 19, 1918. The importance of potash and of the development of the potash industry in the United States.

The Cottrell Processes of Electric Precipitation, with Especial Regard to Their Application to the Recovery of Potash as a By-Product (88952). J. S. Grasty. 5500 w. Mfrs Rec—Sept. 19, 1918. Salient features of the precipitation processes, the uses to which they have been applied, especially the recovery of potash.

The Potash-Bearing States of Georgia (88953). T. Poole Maynard. Ills. 1600 w. Mfrs Rec—Sept. 19, 1918. History and information concerning these deposits.

Domestic Potash Production (82348). 3000 w. Eng & Min JI—Nov. 10, 1917. Resources and their development.

The Recovery of Water-Soluble Potash as a By-Product in the Cement Industry (82190 B). William H. Ross and Albert R. Merz. 4500 w. JI Ind & Eng Chem—Nov., 1917. Experimental study to ascertain the percentage of potash.

Production of Potash in United States (87025). William B. Hicks. 3000 w. Mfrs Rec—June 20, 1918. Revised paper presented at Pittsburgh meeting of Am. Assn. for Adv. of Sci., Dec. 31, 1917. Development of industry; possibility of increased production.

Why Not a Potash Recovery Industry in Australia? (87486 A). Ills. 3800 w. Aust Min Stan—May 23, 1918. An

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account of what has been accomplished in America.

The Nebraska Potash Industry (82-999 A). Ernest E. Thum. Ills. 4500 w. Met & Chem Eng—Dec. 15, 1917. Describes the deposits and their development.

A Study of the De Roode Method for the Determination of Potash in Fertilizer Materials (84766 B). T. E. Keitt and H. E. Shiver. 2500 w. JI Ind & Eng Chem—March, 1918. Shows that the De Roode method overcomes difficulties encountered in other methods. Explains advantages.

Potash (84959 D). 15 pp. A I M E, Bul—March, 1918. Discussion at Jan. meeting of N. Y. Section.

Potash from Wood Ashes (86304 A). C. T. Edgar. Ills. 1500 w. Met & Chem Eng—May 15, 1918. On the development of the potash industry in Michigan and Wisconsin.

The Concentration of Potash from Raw Materials Containing Only a Trace of This Element by Means of the Electric Precipitation of Flue Dust and Fume Cement Kilns (86022 B). B. F. Erdahl. 2500 w. JI Ind & Eng Chem—May, 1918. Outlines experiments and gives results.

Recovery of Potash from Blast Furnace Gases (86475 A). 1000 w. Nature—April 25, 1918. Historical review of experimental work and results secured.

A Neglected Chemical Reaction and an Available Source of Potash (83838 N). E. A. Asheroft. Maps. 7500 w. Instn Min & Met, Bul. 159—Dec. 13, 1917. Describes research work with feldspathic minerals and salts.

Bibliography on the Extraction of Potash from Complex Mineral Silicates, Such as Feldspar, Leucite and Glauconite (Greensland Marl) (83597 A). E. C. Buck. 5 pp. Met & Chem Eng—Jan. 1, 1918. Serial 1st part. Useful in research work.

Enormous Deposits of Potash on Which America May Draw (83668). 2200 w. Mfrs Rec—Jan. 17, 1918. Possibilities of Searles Lake, in California.

Italian Leucitic Lavas as a Source of Potash (83598 A). Henry S. Washington. 7000 w. Met & Chem Eng—Jan. 15, 1918. Possible source of enormous supplies of potash including estimates of quantity.

Gisements De Potasse Nouveaux (83901 B). P. Sallior. Ills. 1800 w. La Nature—Nov. 24, 1917. New potash deposits in Alsace of immense value to Germany.

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Recovery of Potash from Greensand (83606 B). H. W. Charlton. Read before Am. Soc. 2500 w. JI Ind & Eng Chem—Jan., 1918. Details of a process of obtaining caustic potash and converting the residue into a material of value.

The Direct Heat Treatment of Cement Mill Dust to Increase Its Water Soluble Potash Content (84100 B). Albert R. Merz. 2500 w. JI Ind & Eng Chem—Feb., 1918. Methods of recovery.

The Extraction of Potash and Other Constituents from Sea Water Bittern (84099 B). Joel H. Hildebrand. Ills. 6500 w. JI Ind & Eng Chem—Feb., 1918. Methods of recovery; experiments; proposed process.

I. Cleaning Blast-Furnace Gas for Boilers and Stoves. A. Lennox Leigh. II. The Commercial Aspects of the Recovery of Potash in the Manufacture of Pig Iron. Kenneth M. Chance, with short discussion (84149 A). 7000 w. Ir & Cl Trds Rev—Jan. 18, 1918. Read before the Cleveland Instn of Engrs. Special reference to the recovery of potash.

Effect of Coal Ash on the Liberation and Nature of Cement-Mill Potash (84101 B). N. S. Potter, Jr. and R. D. Cheesman. 1800 w. Jr Ind & Eng Chem—Feb., 1918. Research work and results.

Sources of Potash (84599 A). T. E. Thorpe. 2000 w. Nature—Jan. 3, 1918. Distribution of potash in Germany, Spain, Abyssinia and the Caspian region.

Potash, Its Present and Other Possible Sources (84516 N). C. W. Drury. 29 pp. Can Min Inst, Trans—1917. Review with conclusions.

Recovery of Potash from Blast Furnace Gases (84394 N). R. A. Berry and D. N. McArthur, with discussion. 28 pp. West Scot I & S Inst, JI—Oct.-Nov., 1917. Sources of supply, especially industrial by-products.

Recovery of Potash from Blast -Furnace Gases (84255 A). R. A. Berry and D. N. McArthur. 3500 w. Ir & Cl Trds Rev—Jan. 25, 1918. Abstract of paper joint meeting of West of Scot. Ir. & St. Inst. and Soc Chem. Ind. Sources of potash, losses, etc.

Some Methods of Analysis for Nebraska Potash Salts and Brines (84105 B). A. H. McDowell. 1500 w. JI Ind & Eng Chem—Feb., 1918. Gives methods developed.

The Prospects of Founding a Potash Industry in This Country (88173 A). K. M. Chance, with discussion. 6500 w. Ir & Cl Trds Rev—July 26, 1918. Abstract

of paper before Soc. Chem. Ind. (England). Account of development work.

Discussion on "A Neglected Chemical Reaction and an Available Source of Potash" (85786 N). 23 pp. Instn Min & Met, Bul. 160—Jan. 10, 1918. Discussion on E. A. Ashcroft's paper.

Extraction of Potassium Salts from the Pintados Salar (85626). Roger C. Wells. 1500 w. Eng & Min JI—April 13, 1918. Experimental work to discover a method of readily extracting.

100,000 Tons of Potash Obtainable from Cement Dust Every Year (85905). Samuel G. Wilmer. Ills. 4500 w. Mfrs' Rec—April 25, 1918. New industry at Security, Md., and its importance.

Potash in the Pintados Salar, Tarapaca, Chile (85625). Hoyt S. Gale. Maps. 2500 w. Eng & Min JI—April 13, 1918. Saline deposits containing potassium salts. Formation, extent, importance.

L'Industrie Des Sels De Potassium En Temps De Guerre (85887 B). L. Brunet. 8400 w. Rev Générale Des Sciences—Mar. 30, 1918. Potassium industry in war times. Sources, production, methods of extraction, etc.

Pyrite

Pyrite and Pyrrhotite Resources of Ducktown, Tenn. (84359 D). Joseph H. Taylor. 2000 w. A I M E, Bul—Feb., 1918. Deposits and their development. Valuable source of supply of sulphuric acid.

Pyrite in Northern New York (82,791). D. H. Newland. 1200 w. Eng & Min JI—Dec. 1, 1917. Low-grade deposits of considerable extent in the Adirondacks.

Quicksilver

The Position of the Quicksilver Producers in California (88656 A). 3500 w. Eng & Min JI—Sept. 7, 1918. Statement of past and present difficulties. A plea is made for a protective tariff of \$35 per flask.

Rare-Earth Minerals

Zirconium and Rare-Earth Minerals in 1916 (83651 N). Waldemar T. Schaller. 10 pp. U S Geol Surv, II:25—Dec. 22, 1917. Occurrence, uses, production, etc.

Refractories

Refractory Materials in Canada (84,512 N). N. B. Davis. 10 pp. Can Min Inst, Trans—1917. Distribution of raw materials, etc.

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Zirconium

Salt

Intrusive Origin of the Gulf Coast Salt Domes (89107 B). G. Sherburne Rogers. Ills. 38 pp. Ec-Geol—Sept., 1918. Reviews earlier theories and discusses the applicability of a tectonic theory to the American domes.

Salt Mining and Dressing (88654 A). J. B. Calkins. Ills. 2500 w. Eng & Min JI—Sept. 7, 1918. Brief history of the salt industry in America, describing modern mining methods and preparation for market.

La Consommation Et La Production Du Sel (83937 B). N. Flamel. 3000 w. Le Génie Civil—Nov. 17, 1917. Serial. 1st part. Various methods of salt production and manufacture.

The Brenham Salt Dome, Washington and Austen Counties, Texas (82381 N). Oliver B. Hopkins. Map & well logs. 10 pp. U S Geol Surv, 661-G—Oct., 1917. Location, topography, geology, wells drilled, etc.

The Palestine Salt Dome, Anderson County, Texas (82380 N). Oliver B. Hopkins. Maps. 18 pp. U S Geol Surv, Bul 661-G—Oct., 1917. Location, topography, geology of this and surrounding districts.

The Salt Trade of the United States (88393 A). Ills. 3000 w. Engng—July 26, 1918. Serial, 1st part. Mainly information from a report by W. C. Phalen on the "Technology of Salt Production in the Union."

Slate

Slate in 1917 (88058). G. F. Loughlin. 18 pp. U S Geol Surv, II : 9—July 30, 1918. Production, etc.

Sulphur

Use of Sulphur in Fertilization (84155). Courtenay De Kalb. 1500 w. Mfrs Rec—Feb. 7, 1918. Conditions for success in its use.

The Mineral Industries of the United States (84877). Sulphur: An Example of Industrial Independence. Joseph E. Pogue. Ills. 8 pp. U S Natl Museum—Bul. 102, Part 3.

Southern Resources

Mineral Resources of the Appalachian South (85993 A). Ills. & Map. 11 pp. Met & Chem Eng—May 1, 1918. A symposium by southern state geologists on the raw materials suitable for chemical or metallurgical development.

Tin

A Statistical Summary of Tin (89384 A). Edith M. Miller. Ills. 6000 w.

Chem & Met Eng—Sept. 28, 1918. Reviews the development of its economic uses.

Tin Deposits of Irish Creek, Virginia (83484). Henry G. Ferguson. Sketch maps. 2200 w. Eng & Min JI—Jan. 5, 1918. Report of tin veins in Rockbridge County and the prospect of successful development.

Concentration of Tin Gravels and a Proposed Alternative for Sluice-Boxes and Twommels (82115 A). W. W. Richardson. Ills. 2200 w. Min Mag—Oct., 1917. Details of improved method.

Titanium

The Metallurgy of Titanium (82455 B). Robert J. Anderson. Ills. 14 pp. Fkn Inst, JI—Nov., 1917. Serial, 1st part. Various uses and methods.

Tungsten

A Tungsten Deposit Near Fairbanks, Alaska (85055 B). Alan M. Bateman. 1500 w. Econ Geol—March, 1918. Brief description of this tungsten occurrence.

Tungsten Ore Deposits Near Falcon Lake, Man. (86704). Justin S. De Lury. Ills. 1800 w. Can Min JI—June 1, 1918. The ores and their occurrence.

The Metallography of Tungsten (86910 D). Zay Jeffries. Ills. 56 pp. A I M E, Bul—June, 1918. Notes on the manufacture and metallography of wrought and ductile tungsten, and the general relationship between the properties of tungsten and other metals.

The Production of Quicksilver and Tungsten (87418). Maps. 2800 w. Min & Sci Pr—July 6, 1918. As discussed before the U. S. Tariff Commission at San Francisco. Production and prices.

Tungsten Works

Tungsten Manufacturing Works at Widnes (82374 A). Ills. 2200 w. Engng—Oct. 26, 1917. The works and details of the processes.

Zirconia

Zirconia—Its Possibilities in Metallurgy (86283 A). Leopold Bradford. Abstract of paper read before the Birmingham Metallurgical Soc., with discussion. 3300 w. Ir & Cl Trds Rev—March 22, 1918. Its value as a refractory; its uses, etc.

Zirconium

Properties and Uses of Zirconium and Its Compounds (84306). Excerpt from paper by H. G. Meyer. 1800 w. Eng & Min JI—Feb. 16, 1918. Discusses properties and uses in manufacture of zirkite bricks and laboratory ware.

OIL AND GAS

Gasoline

Acetylene

Dissolved Acetylene and Its Storage (84679 A). 1800 w. Engr—Feb. 8, 1918. Recommendations of committee appointed to consider, and suggest amendments to regulations.

Alabama

Possible Oil and Gas Fields in the Cretaceous Beds of Alabama (84355 D). Dorsey Hager. Map. 2200 w. A I M E, Bul—Feb., 1918. Outlines four favorable areas.

Benzol

Laboratory Methods for Benzol-Recovery Plant Operation (82224 A). F. W. Speer, Jr. Ills. 6000 w. Met & Chem Eng—Nov. 1, 1917. Serial, 1st part. Details of laboratory methods for by-product coke oven plants, worked out by the Koppers Co.

Berea Sand

Lithology of the Berea Sand in Southeastern Ohio, and Its Effect on Production (88210 D). L. S. Panyity. Ills. 4 pp. A I M E, Bul—Aug., 1918. A study of this oil and gas producer.

British Isles

Oil Prospects of the British Isles (83061 A). W. H. Dalton. Read before Inst. of Petroleum Tech. 2500 w. Colly Gdn—Nov. 23, 1917. Does not think there are deposits of commercial value.

Cracking Processes

The Rittman and other Cracking Processes (83659 A). H. G. James. 1200 w. West Eng—Jan., 1918. Recent improvements makes possible large increase in production of gasoline.

Fuel

See same heading under Coal and Coke. Also Oil Fuel, page 279.

Fuel Oil

California Petroleum as a Fuel Oil (89497). Thomas J. Royer, with discussion. Ills. 4800 w. Natl Engr—Oct., 1918. History of development, study of use in steam boiler practice, and suggestions for satisfactory operation.

El Petróleo como combustible (89717 A). J. R. Pérez. 3200 w. Rev Soc Cubana De Ingenieros—Sept., 1918. Crude oil for fuel, its properties, fuel value and methods of burning.

Home Sources of Fuel Oil (88622 A). 5000 w. Ir & Cl Trds Rev—Aug. 9, 1918. Two official Committee reports dealing with this question.

War Status of Gasoline and Fuel Oil (88825 A). John D. Gill. Ills. 5000 w. E Cb Phila, J1—Sept., 1918. Explains the character and uses of gasoline and fuel oil; the present supply; substitutes, etc.

Fuel Oil Supply (87144). 1600 w. Times Engng Supp—May, 1918. Oil obtained by distillation from cannel coal at gas works.

Gas

Future Gas-Making Practice (83921). 2200 w. Times Engng Supp—Nov. 30, 1917. Effect on the methods employed of the change in standard of calorific power for coal gas in England.

Gas Industry

The Future of the Gas Industry (87351 A). 2200 w. Engr—June 7, 1918. The type of gas required; flame temperature; diluents; organization for the future.

The Gas Industry (87400 A). Lord Moulton. Presidential address. 5500 w. Engng—June 14, 1918. Response of this industry in furnishing material for war purposes, its capacity for service. Reviews the history of development and the future needs.

Gasoline

Recovery of Gasoline from Casing-Head and Natural Gas (89284 A). Paul Diserens. Ills. 4000 w. A S M E, J1—Oct., 1918. Process most used in the recovery is described, with suggestions for improvements.

Recovery of Gasoline from Natural Gas by Compression and Refrigeration (87081 A). W. P. Dykema. Ills. 117 pp. U S Bur Mines—Bul. 151. Treats of this process from viewpoint of practical engineer and business man.

Solving the Gasoline Problem (83-173 B). W. P. Deppé, with discussion. Charts. 9500 w. S A E, J1—Dec., 1917. Methods of increasing the quantity and of avoiding waste.

Solvent Gasoline (82191 B). C. Olin North. 4000 w. J1 Ind & Eng Chem—Nov., 1917. Experiments made for securing a good grade of solvent gasoline at a reasonable price by cracking heavy oils.

The Supply of Gasoline (82355). Milton A. Allen. 1500 w. West Eng—Nov., 1917. Methods of increasing the supply.

Recovery of Gasoline from Casing Head and Natural Gas (84911 A). Paul Diserens. Ills. 4500 w. E Cb St L, J1—Jan.-Feb., 1918. Discusses recovery from casing-head gas.

Testing Natural Gas for Gasoline (84764 B). G. G. Oberfell. Ills. 2000 w. J1 Ind & Eng Chem—March, 1918. Report of tests with comments.

Extraction of Gasoline from Natural Gas as an Industry Allied to Production and Refining of Petroleum

Hazards

(83872 D). Frank P. Peterson. Ills. 4500 w. A I M E—Dec., 1917. Details of important factors.

Hazards

Gasolene and Kerosene Hazards (86326). Ills. 1300 w. Telephony—May 18, 1918. Dangers in handling. Instructions in use of kerosene torches.

Illinois

Oil and Gas Fields of Illinois (83860). H. A. Wheeler. Ills. & Map. 2500 w. Eng & Min JI—Jan. 26, 1918. Occurrences which have made Illinois the second largest producer of high grade oil since 1907.

Infiltration

Reduction of Water-Infiltration in Oil-Well (85513 A). R. P. McLaughlin. Ills. 1200 w. West Eng—April, 1918. Solution of a serious oil problem.

Inflammable Gas

The Estimation of Methane in Surface Strata (87076 A). C. D. Mottram. 1700 w. Colly Gdn—May 31, 1918. Work undertaken to determine whether any inflammable gas was rising from the surface of certain fields.

Motor Spirit

The Roma Oil Bore (87491 N). W. E. Cameron. Ills. 1500 w. Qnsd Gov Min JI—May, 1918. Prospects of obtaining motor spirit from the gas.

Naphthalene

The Trouble of Naphthalene (85207). 2000 w. Times Engng Supp—Feb. 22, 1918. Removal of deposits, methods of treatment, "Pleno" gas, etc., etc.

Natural Gas

Present Situation Relating to the Introduction and Use of Natural Gas in New Orleans (88194 A). Howard Eggleston. 1200 w. La Eng Soc, Pro—Aug., 1918. Past and present conditions.

The Natural Gas Situation in Cleveland During the Winter of 1916-1917 (82164 B). George L. McKibben. 9000 w. Cleve Eng Soc, JI—Sept., 1917. Report of the natural gas survey and history of production, consumption, waste, etc.

Oil

Oil and Its Applications (84258 A). Abstract of lecture by A. F. Baillie before Gloucester Engng. Soc. 2000 w. Ir & Cl Trds Rev—Jan. 25, 1918. Applications and advantages in comparison with coal.

Water Surfaces in the Oil Fields (83866 D). Marcel R. Daly. Ills. 2500 w. A I M E, Bul—Jan., 1918. A study of the conditions of equilibrium of the "free surface" of a water body enclosed in a porous medium.

OIL AND GAS**Oil Fields**

Home-Produced Oil (85209). 2700 w. Times Engng Supp—Feb. 22, 1918. Distillation of cannel coal discussed by British Inst'n Petroleum Technologists.

A New British Oil Industry (84836 A). E. H. Cunningham Craig. 2500 w. Colly Gdn—Feb. 22, 1918. From paper before Instn of Petroleum Tech. On prospects of founding a new industry for increasing supplies of fuel oil, including petrol.

A New British Oil Industry (85132 A). 1000 w. Nature—Feb. 28, 1918. Progress in the discovery and utilization of coals and shales that will yield oil.

The Search for New Oil Pools in the United States (83485). Dorsey Hager. Map. 1800 w. Eng & Min JI—Jan. 5, 1918. Reviews possibilities in various states.

Kansas - Oklahoma Oil Production Worth Million Dollars a Day (82732). C. M. Sarchet. 1200 w. Mfrs' Rec—Nov. 29, 1917. Production and demand.

La Transformation Des Huiles Minérales Lourdes (82657 B). Ills. 4000 w. Génie Civil—Oct. 13, 1917. Review of processes of distillation and cracking of heavy oils.

Oil Deposits

Possible Existence of Deep-seated Oil Deposits on the Gulf Coast (87675 D). Anthony F. Lucas. Ills. 16 pp. A I M E, Bul—July, 1918. Possibility of finding deep-seated oil deposits beneath the salt domes.

Oil Fields

The Glenmary Oil Field (88911 N). L. C. Glenn. 9 pp. Resources Tenn—July, 1918. Information concerning oil wells.

The Haldton Oil Field, Oklahoma (83049 B). Sidney Powers. 4000 w. Ec-Geol—Oct.-Nov., 1917. Geologic structure, character of oil, development, etc.

Cementation in the Illinois Oil Field (86944). M. L. Nebel. Ills. 2500 w. Eng & Min JI—June 15, 1918. Exclusion of water from oil wells in drilling.

The Geologist and the Development of Our Oil Fields (86905 N). M. Y. Williams. Maps. 3000 w. Can Min Inst, Bul—June, 1918. Deals particularly with work in Canada.

The Significance of Certain Mexican Oil Field Temperatures (86868 B). E. De Golyer. 27 pp. Ec Geol—June, 1918. Methods of temperature measurements; general geologic conditions.

New Texas Oil Fields a Center of Great Activity (86016). M. E. Martin. 1500 w. Mfrs' Rec—May 2, 1918. Information concerning recent developments.

Oil Fuel

Oil in Southern Tamaulipas, Mexico (86414 D). Ezequiel Ordoñez. Map. 2800 w. A I M E, Bul—May, 1918. Oil possibilities discussed.

The Kentucky Oil Fields (85967). W. N. Thayer. Map. 3500 w. Eng & Min JI—April 27, 1918. Oils are of a paraffin base and are marketed in two grades.

Water Troubles in the Mid-Continent Oil Fields, and their Remedies (89576 D). Dorsey Hager and G. W. McPherson. Ills. 2500 w. A I M E, Bul—Oct., 1918. Analysis of water trouble and remedies.

Texas Ranger Oil Field Reaches National Importance (88241). 1200 w. Mfrs Rec—Aug. 15, 1918. Pronounced one of the greatest in the world.

Oil Fuel

Burning Oil Fuel (84638). A. Gordon. 2200 w. Natl Engr—March, 1918. Comparative performance of oil and coal as fuel. See also page 335.

See same heading under Mechanical Engineering, Steam Engineering.

Oil Geology

See same heading under Geology.

Oil Handling

Gaging and Storage of Oil in the Mid-Continent Field (84966 D). O. U. Bradley. Ills. 10 pp. A I M E, Bul—March, 1918. Features of the handling practice.

Oil Industry

The Oil Industry and Its Relation to War (88346). 3500 w. Mfrs Rec—Aug. 22, 1918. Extracts from addresses of M. L. Requa and A. C. Bedford.

Oil Lands

Methods of Valuing Oil Lands (84353 D). M. L. Requa. 20 pp. A I M E, Bul—Feb., 1918. Methods adopted by the Committee of the Independent Oil Producers' Agency.

Oil Losses

Losses of Crude Oil in Steel and Earthen Storage (87676 D). O. U. Bradley. 4 pp. A I M E, Bul—July, 1918. Losses due to evaporation, sediment, water, and leakage.

Oil Prospecting

Principles and Problems of Oil Prospecting in the Gulf Coast Country (85795 D). 5500 w. A I M E, Bul—April, 1918. Discussion of W. G. Matteson's paper.

Principles and Problems of Oil Prospecting in the Gulf Coast Country (84354 D). W. G. Matteson. Ills. 40 pp. A I M E, Bul—Feb., 1918. The extent, history, topography and physiography, stratigraphy, etc., of the Gulf Coast Plain. Methods of surveying, prospecting and developing.

OIL AND GAS

Oil Recovery

Methods for Increasing the Recovery from Oil Sands (83792). J. O. Lewis. Ills. 114 pp. U S Bur Mines—Bul. 148. Principles involved in increasing recovery and methods of extracting more oil.

Oil Refining

The Solubility of Paraffins, Aromatics, Naphthenes, and Olefins in Liquid Sulphur Dioxide (85681 A). Robert J. Moore, J. C. Morrell and Gustav Egloff. Ills. 5000 w. Met & Chem Eng—April 15, 1918. A study of the possible utility of liquid sulphur dioxide in oil refining and analysis.

The Trumble Refining Process (82913 A). N. W. Thompson. Ills. 13 pp. A S M E—Dec., 1917. Details of the process with description of an actual plant. Chief advantage is the conservation of heat.

Oils

A Comparison of Linseed Oil and Lumbang Oils as Paint Vehicles (84190 N). R. H. Aguilar. Ills. 2000 w. Phil JI Sci—Sept., 1917. Comparative tests on the properties.

Oil Seeds

Indian Trade in Oil Seeds (85038 N). 75 pp. Imp Inst, Bul—July-Sept., 1917. Statement showing the great value of the Indian oil seed trade, and the desirability of securing a far larger proportion of the output.

Three New Oil Seeds from West Africa (85036 N). 1500 w. Imp Inst, Bul—July-Sept., 1917. Information concerning N'gore nuts, N'kamba nuts, and Strephonema kernels.

Oil Shale

The Oil-Shale Industry (86239 A). Arthur J. Hoskin. Ills. 5000 w. West Eng—May, 1918. Varieties of shale, methods of distillation, prospective development, etc.

Commercial Aspects of the Shale-Oil Industry (86079). J. H. G. Wolf. 1800 w. Min & Sci Pr—May 4, 1918. Deficiency of domestic oil production; necessary to consider the shale-oil problem.

The Oil-Shale Industry (85615). Arthur J. Hoskin. Map & Ills. 6000 w. Min & Sci Pr—April 13, 1918. Areas of oil-yielding shale. Geology; methods of distillation, etc.

Oil Shales

Will Shales Give Us Oil and Gasoline in Practically Unlimited Supply? (88611). 3000 w. Mfrs Rec—Sept. 5, 1918. Important aspects of the problem of making available these natural resources.

Oil Storage

The Economic Position of Oil Shales (86659 A). Jac. C. Morrell and Gustav Egloff. 7000 w. Met & Chem Eng—June 1, 1918. Economic distribution, methods of production, yields, etc.

Oil Storage

Oil-Storage Tanks and Reservoirs (86138 A). C. P. Bowie. Ills. 70 pp. U S Bur Mines—Bul 155. With brief discussion of losses of oil in storage and methods of prevention.

The Storage of Petroleum (89531 A). Ills. 3500 w. Engng—Sept. 20, 1918. Information from report of the U. S. Bureau of Mines, explaining the system in general use in the United States.

Oil Supply

An Optimistic View of the Future Supply of Oil (83604 A). I. N. Knapp. Ills. 11 pp. E Cb Phila, J1—Jan., 1918. Shows that supplies of shale oil to supplement petroleum makes an oil famine improbable.

Oil Wells

Cement Plugging for Exclusion of Bottom Water in the Augusta Field, Kansas (89575 D). H. R. Shidel. Ills. 1400 w. A I M E, Bul—Oct., 1918. Results obtained from the preliminary cementing of wells to cut off the bottom water.

Some New Methods for Estimating the Future Production of Oil Wells (84356 D). J. O. Lewis and Carl H. Beal. 28 pp. A I M E, Bul—Feb., 1918. Discusses some new methods for estimation of production.

A Concrete Example of the Use of Well Logs (86412 D). Mowry Bates. Maps. 1600 w. A I M E, Bul—May 1, 1918. Practical application of engineering geology showing the advantage of keeping accurate records of all wells.

Oil Well Drilling (85047 A). W. C. Bochart. Ills. 13 pp. Pahasapa Qr—Feb., 1918. Progress of drilling methods. Staggering Locations for Oil Wells (88209 D). Roswell H. Johnson. 5 pp. A I M E, Bul—Aug., 1918. Suggestions for assisting the producer in planning.

Ontario

Oil Prospecting in Southwestern Ontario (84532). M. Y. Williams. Maps. 1200 w. Can Min J1—Feb. 15, 1918. Suggestions to prospectors.

"Paraffin Dirt"

An Interpretation of the So-called Paraffin Dirt of the Gulf Coast Oil Fields (87678 D). 6 pp. A I M E, Bul—July, 1918. Discussion of Albert D. Brokaw's paper.

An Interpretation of the So-called Paraffin Dirt of the Gulf Coast Oil

OIL AND GAS

Producer Gas

Fields (85806 D). Albert D. Brokaw. 1200 w. A I M E, Bul—April, 1918. An interpretation based upon laboratory study.

Petroleum

Petroleum and Its Products (82717 B). Van H. Manning. 6500 w. S A E, J1—Nov., 1917. Limitations of supply, methods of producing gasoline, production, waste, etc.

The Petroleum Geology of the Isthmus of Tehuantepec (83047 B). Burton Hartley. Map. 2000 w. Ec-Geol—Oct.-Nov., 1917. Geology, deposits, structural features, etc.

Unmined Petroleum Supply Limited (88982). Allen Sinsheimer. Ills. 1500 w. Auto Ind—Sept. 19, 1918. Estimated at 70 barrels per person in the United States.

Chemistry in the Petroleum Industry (86765 B). William M. Burton. Address at the awarding of the Willard Gibbs medal. 3500 w. J1 Ind & Eng Chem—June, 1918. Outlines the work of the chemist in the refining of petroleum and the distillation of the various products.

Bibliography of Petroleum and Allied Substances, 1915 (86816). E. H. Burroughs. 125 pp. U S Bur Mines—Bul. 149. Index to petroleum literature of the year.

Petroleum Production in Texas Over 5,000,000 Barrels Increase for 1917 (84680). 1200 w. Mfrs' Rec—Feb. 28, 1918. Statistics of production and information relating to the oil industry.

The History of Petroleum Production (85048 A). W. A. Waldschmidt. Table. 3000 w. Pahasapa Qr—Feb., 1918.

The Refining of Petroleum (85046 A). M. L. Hartmann. Ills. 11 pp. Pahasapa Qr—Feb., 1918. Processes and products developed.

The Petroleum Industry in Kansas (86069). W. A. Whitaker, Clarence Estes, and F. W. Campbell. Ills. 3000 w. Eng & Min J1—May 4, 1918. Reviews the history of development, production statistics, costs, etc.

The Work of the Petroleum Geologist (86070). George E. Burton. 2500 w. Eng & Min J1—May 4, 1918. Work in discovering oil and gas.

Petroleum and Natural Gas (88129 A). Ills. 4000 w. Aust Min Std—June 27, 1918. Serial, 1st part. History, occurrence, origin, chemistry, production, etc.

Producer Gas

See same heading under MECHANICAL ENGINEERING, *Combustion Motors*.

ORE DRESSING

Bunker Hill

Refining

The Maintenance of High Ampere Efficiency in Electrolytic Copper Refining (87666 A). M. H. Merriss and M. A. Mosher. Ills. 4000 w. Eng & Min JI—July 20, 1918. Practical work of maintaining efficiency by organization and suitable apparatus.

Reservoirs

Système De Flottéur Réduisant Les Pertes Par Évaporation (87135 B). A. Grebel. Ills. 4000 w. Génie Civil—May 11, 1918. Gaging system to reduce losses of volatile liquids by evaporation.

Rumania

The Petroleum Industry of Rumania (84143 A). 2500 w. Engng—Jan. 18, 1918. Editorial review of a paper by T. S. Masterson.

Shale Oil

Commercial Aspects of the Shale-Oil Industry (86798). J. H. G. Wolf. 2000 w. West Eng—June, 1918. Requirements for a successful plant.

South America

The Economic and Geologic Conditions Pertaining to the Occurrence of Oil in the North Argentine-Bolivian Field of South America (88775 D). Stanley C. Herold. Ills. 20 pp. A I M E, Bul—Sept., 1918. Describes this region and its development.

Sperm Oils

Some Data on Sperm Oils Used for Burning in Miners' Safety Lamps (85223).

A. G. Blakeley and E. A. Reilly. 1000 w. Cl Age—March 23, 1918. Results of investigations, with explanatory notes.

Some Data on Sperm Oils Used for Burning Purposes (82788 B). Abraham G. Blakeley and Edmund A. Reilly. 1000 w. JI Ind & Eng Chem—Dec., 1917. Results of tests made of oil used in miners' safety lamps.

Toluol

Toluol from Spruce Turpentine (86-023 B). A. S. Wheeler. 1000 w. JI Ind & Eng Chem—May, 1918. Yields toluol when subjected to the combined action of benzol aluminium chloride.

Intensive Toluol Production (84075 A). Frank E. Lichtenthaeler. Ills. 6500 w. Met & Chem Eng—Feb. 1, 1918. Serial, 1st part. Proposed improvements in the absorbing and stripping process.

Tuluol Recovery and Standards for Gas Quality (84102 B). R. S. McBride. 3000 w. JI Ind & Eng Chem—Feb., 1918. Present standards of gas quality and conditions; influence of toluol recovery on quality; recommendations.

Vegetable Oils

South's Opportunity to Build Up Great Industry in Vegetable Oil Production (85314). Charles A. Whittle. 1500 w. Mfrs' Rec—March 28, 1918. Emphasizes the opportunity of the vegetable oil industry in the South.

ORE DRESSING

Africa

Data on Crushing and Cyaniding in a West African Mill (87529). Paul T. Bruhl. Ills. 2500 w. Eng & Min JI—July 13, 1918. Results obtained in a Gold Coast Colony mill.

Amalgamation

Amalgamation and Roasting Practice in Gold Coast Colony (84465). Paul T. Bruhl. 2500 w. Eng & Min JI—Feb. 23, 1918. Practice in Africa. Correct procedure under varying conditions.

Antimony Smelting

The Practice of Antimony Smelting in China (85805 D). Chung You Wang. Ills. 3500 w. A I M E, Bul—April, 1918. Results of many years experience.

Arizona Plant

The United Verde Extension Mining Company's Smelter and Converter Plant (89614 A). F. E. Nichols. Ills. 1200 w. Eng & Min JI—Oct. 19, 1918. Plans and information concerning a notable Arizona metallurgical plant.

Auxiliary Plant

The Granby Auxiliary Steam Plant at Anyox, B. C. (86544). Ills. 3500 w. Pr House—May, 1918. Serial, 1st part. The steam plant auxiliary of one of the largest smelters in British Columbia.

Baghouses

Baghouses for Zinc Oxide (87671 A). John F. Cregan. Ills. 6000 w. Eng & Min JI—July 20, 1918. Problems in baghouse design and operation.

Ball-Milling

Notes on Theory and Practice of Ball-Milling, Particularly Peripheral Discharge Mills (84342 D). Pierre R. Hines. Ills. 3300 w. A I M E, Bul—Feb., 1918. Practical operation, particularly of the diaphragm type.

Bunker Hill

Smelting and Lead Refining at the Bunker Hill Plant (89678 A). C. T. Rice. Ills. 1500 w. Eng & Min JI—Oct. 26, 1918. Fourth of a series of articles on the design and operation of the Bunker Hill & Sullivan plant.

ORE DRESSING

Decantation Plant

Concentration

Belt Concentrators and Wet Concentration (87423). Alex. McLaren. 1800 w. Eng & Min J1—July 6, 1918. Considers the limitations of belt concentrators and riffled tables.

Minerals Separation v. Butte & Superior (86554). 5000 w. Min & Sci Pr—May 25, 1918. Opinion U. S. Circuit Court of Appeals.

Dry Sizing as a Means of Preparing Feed for Concentration (86398). George V. Bland. 4000 w. Eng & Min J1—May 18, 1918. Theory of the process is discussed.

Magnetic Concentration of Iron Ores at Mineville, N. Y. (86399). Earl C. Henry. Ills. 1200 w. Eng & Min J1—May 18, 1918. Magnetite ores containing about 30% iron are treated magnetically.

Concentration Tests

Comparative Concentration Tests on Wood and Fluted Glass Surfaces at Porco, Bolivia (82931 N). Harold A. Lewis. 12 pp. Instn Min & Met, Bul 158—Nov. 8, 1917. Account of trials made and results.

Slime Treatment on Cornish Frames: with Particular Reference to the Effect of Surface (82930 N). S. J. Truscott. Ills. 68 pp. Instn Min & Met, Bul 158—No. 8, 1917. Report of tests, the apparatus and methods of testing, etc.

Concentrator

The Taylor Concentrator for Tin and Lime (83836 A). J. Waring Partington. Ills. 1200 w. Min Mag—Dec., 1917. Particulars of a new table which is giving improved results.

Condensation

The Condensation of Zinc from Its Vapor (88212 D). Charles H. Fulton. Ills. 20 pp. A I M E, Bul—Aug., 1918. Experimental study and investigations.

Copper

The Relation of Sulphur to the Overpolling of Copper (84963 D). Stanislaus Skowronski. Ills. 1200 w. A I M E, Bul—March, 1918. Experiments show that sulphur is the direct agent.

Heap-Leaching of Copper-Sulphide Ore (82687). Courtenay De Kalb. Ills. 4500 w. Min & Sci Pr—Nov. 24, 1917. Methods at Copper Queen mine, Bisbee, Arizona.

Copper Cathodes

Oxygen and Sulphur in the Melting of Copper Cathodes (84962 D). Stanislaus Skowronski. 1000 w. A I M E, Bul—March, 1918. Gives results of samples taken at regular intervals during the melting and refining.

Copper Ore

Nitric Acid and Copper Ore (84956 A). George C. Westby. Ills. 4000 w. Met & Chem Eng—March 15, 1918. Story of an attempt to utilize nitric acid in ore treatment.

Copper Oxide

Sulphur and Copper Oxide Determination (84466). C. G. Maier. 1600 w. Eng & Min J1—Feb. 23, 1918. Analytical determination of copper present in the form of oxidized minerals in ores or mill products.

Copper-Leaching

Copper-Leaching at Ajo (84207). Courtenay De Kalb. Ills. 6000 w. Min & Sci Pr—Feb. 9, 1918. Metallurgical difficulties overcome; details of treatment; practical results.

Crushing

Crushing Resistance of Various Ores (88203 D). Luther W. Lennox. 10 pp. A I M E, Bul—Aug., 1918. Investigations and results, with screen analyses.

Recent Tests of Ball-mill Crushing (83869 D). C. T. Van Winkle. 3000 w. A I M E, Bul—Jan., 1918. Tests of Hardings vs. Marcy mill at Inspiration, etc.

Recent Tests of Ball-mill Crushing (85793 D). 4500 w. A I M E, Bul—April, 1918. Discussion of C. T. Van Winkle's paper.

Cyaniding

The Estimation of Oxygen in Working Cyanide Solutions (88588 N). H. A. White, with discussion. 3500 w. Chem, Met, & Min Soc S Af, J1—June, 1918. Explains a new colorimetric method.

Charcoal as a Precipitant of Gold from Its Cyanide Solution (83217 N). H. R. Edmands. Ills. 2200 w. Cham Mines W Aust, Mthly J1—Sept., 1917. Features of the process, method of working, etc.

Cyaniding a Small Gold-Tailings Dump (83035). A. W. Allen. Ills. 6500 w. Eng & Min J1—Dec. 15, 1917. Describes plant suitable for man with little capital.

Decantation

Countercurrent Decantation (84511 N). L. B. Eames. 18 pp. Can Min Inst, Trans—1917. Principles and characteristics of the process, mechanical problems, and details of Hollinger plant.

Decantation Plant

A Description of the Decantation Plant in Operation at the Great Fingall Mine, Day Dawn (86376 N). W. B. Chomley. 2200 w. Cham Mines W Aust, Mthly J1—Feb., 1918. Describes the plant and method of working.

ORE DRESSING

Flotation

Electrometallurgy

Electrolytic Treatment of Complex Zinciferous Ores (82421 A). P. M. Gillies. Read before Soc. of Chem. Ind., Victoria. 1800 w. Aust Min Stand—Sept. 27, 1917. Serial, 1st part. Briefly describes the principal methods employed in producing zinc, particularly electrolytic methods.

Flotation

Chemicals Used in Ore Flotation (82194 B). Oliver C. Ralston and L. D. Yundt. 5000 w. JI Ind & Eng Chem—Nov., 1917. The use and theories of action; the possibilities.

Flotation of Chalcopyrite—Pyrrhotite Ores of Southern Oregon (82223 A). Will H. Coghill. 2200 w. Met & Chem Eng—Nov. 1, 1917. Results of an investigation.

Notes on Vacuum Filtration of Flotation Concentrates (82519). Ralf R. Woolley. 1800 w. Eng & Min JI—Nov. 17, 1917. Drying of material with low mineral content must be done cheaply.

Cascade Method of Froth Flotation (87759). W. A. Fahrenwald. Ills. 500 w. Min & Sci Pr—July 20, 1918. New types of apparatus utilizing the principle of agitation by fall of pulp.

Notes on Flotation (87600 N). R. W. Diamond. 2200 w. Can Min Inst, Bul—July, 1918. Deals only with bulk flotation—the concentration of all sulphides present in an ore into the froth product.

Differential Flotation of Lead-Zinc Tailings at a Small Plant (88964 A). 1000 w. Eng & Min JI—Sept. 21, 1918. Describing treatment of tailings containing lead and zinc sulphides.

Differential Flotation at Wallace, Idaho (88799 A). C. T. Rice. Ills. 900 w. Eng & Min JI—Sept. 14, 1918. Treatment of zinc-lead sulphide ores.

The Terry Differential Flotation Process (89349 A). 1000 w. Chem & Met Eng—Sept. 15, 1918. Based on the discovery that ammonia in solution promotes oxidation of metallic sulphides by air introduced into the pulp.

Molecular Forces and Flotation (86632). Will H. Coghill, with editorial. Ills. 4000 w. Min & Sci Pr—June 1, 1918. Principles of the drop-weight method for surface tension.

On the Molecular Physics of Ore Flotation (86658 A). Will H. Coghill and C. O. Anderson. Ills. 3500 w. Met & Chem Eng—June 1, 1918. Underlying principles involved in calculating the flotability of solids.

A Flotation Patent (83183). Ills. 2000 w. Min & Sci Pr—Dec. 22, 1917.

Walter A. Scott's method of introducing oils in form of vapor with the air.

Control of Emulsions in Flotation (83028). Alfred Schwarz. 1200 w. Min & Sci Pr—Dec. 15, 1917. Editorial letter. Colloids will sometimes perform the office of oils in flotation.

Flotation at Cobalt, Ontario (82952). W. E. Simpson. Also editorial. Ills. 4500 w. Min & Sci Pr—Dec. 8, 1917. History of attempts to apply flotation to the silver ores. Results.

Status of Flotation—Patent Litigation (82793). R. C. Canby. 9500 w. Eng & Min JI—Dec. 1, 1917. Lucid review of flotation-patent litigation in America.

The Effect of Addition Agents in Flotation (83003 A). M. H. Thornberry and H. T. Mann. 2200 w. Met & Chem Eng—Dec. 15, 1917. Serial, 1st part. Experimental studies. This article deals with the effects of sulphuric acid and a number of sulphates.

Cascade Method of Froth-Flotation (85614). H. Hardy Smith. Ills. 3000 w. Min & Sci Pr—April 13, 1918. Details of this process and its advantages. Use of steam for dispersing the oil.

Canadian Wood Oils for Ore Flotation (84502 N). C. S. Parsons and R. E. Gilmore. 55 pp. Can Min Inst, Trans—1917. Investigations and satisfactory results.

Flotation License of Minerals Separation North American Corporation (84307). 2500 w. Eng & Min JI—Feb. 16, 1918. The license agreement is reviewed.

Flotation of Chalcopyrite—Pyrrhotite Ore (84208). Will H. Coghill. 1500 w. Min & Sci Pr—Feb. 9, 1918. Tests on Oregon ores; results.

Present Flotation Practice on Cobalt Ores (84501 N). J. M. Callow and E. B. Thornhill. 1800 w. Can Min Inst, Trans—1917. Shows adaptability of flotation to low-grade ores and mill products.

Sea-Water for Flotation (84050). 900 w. Min & Sci Pr—Feb. 2, 1918. Saline waters, without oil, will float sulphides.

Scientific Nominalism and Flotation Physics (84049). Dudley H. Norris. 4800 w. Min & Sci Pr—Feb. 2, 1918. Science dominated by nominalism; application to flotation; Norris patent.

Differential Flotation of Lead and Zinc (85958). W. L. Zeigler. Ills. 1200 w. Eng & Min JI—April 20, 1918. Practice in the Coeur d'Alene district.

Effect of Addition Agents in Flotation (86400). Ills. 1800 w. Eng & Min JI—May 18, 1918. Sulphates and

Flotation

alums were added to the flotation pulp in a series of tests to determine their effect.

Flotation at Belmont Surf Inlet Mines (85954). A. H. Jones. Ills. 1500 w. Eng & Min JI—April 20, 1918. After tests to determine proper flow sheet, a process was adopted involving gravity concentration followed by re-grinding and flotation.

Flotation in Arizona (85953). Rodolf Gahl. 2500 w. Eng & Min JI—April 20, 1918. Treatment of copper ores of the disseminated type. Review of recent developments.

Flotation in the Coeur d'Alenes (85952). Claude T. Rice. Ills. 7500 w. Eng & Min JI—April 20, 1918. Reviews the process as applied to this district of Idaho. Details of method used for silver lead and lead-zinc ores as supplementary to gravity methods.

Flotation in Relation to Gangue Minerals (85957). James M. McClave. 1400 w. Eng & Min JI—April 20, 1918. Field experiences in the application of the flotation process.

Flotation of Semi-Oxidized Silver Ore (85960). E. J. Atckison Flow sheet. 2000 w. Min & Sci Pr—April 27, 1918. The economics of methods in Mexico as compared with cyanidation.

Flotation vs. Cyanidation (85959). G. H. Clevenger. 3500 w. Eng & Min JI—April 20, 1918. A comparison showing that cyanidation often has advantage in net returns.

Handling Flotation Concentrates at Utah Leasing Co.'s Plant (85955). H. H. Adams. Ills. 2000 w. Eng & Min JI—April 20, 1918. Plant and operating details and difficulties encountered in handling cuperiferous tailings of low grade.

Troubles in Flotation (85956). Oliver C. Ralston. 3500 w. Eng & Min JI—April 20, 1918. Review of the more important difficulties encountered.

Minerals Separation v. Butte & Superior (85060). Also editorial. 5000 w. Min & Sci Pr—March 16, 1918. Part of brief for defendant. It is contended, in limiting the flotation of plaintiff to the "critical" proportions of oil that defendant had not infringed.

Minerals Separation v. Butte & Superior (85222). Also editorial. 7000 w. Min & Sci Pr—March 23, 1918. Part of brief for plaintiff-appellee.

The Groch Flotation Machine (84-896 N). F. O. Groch and W. E. Simpson. Ills. 1200 w. Can Min Inst, Bul

ORE DRESSING

Laboratory

—March, 1918. Summarizes general principles underlying the flotation process, and describes this machine of the froth-forming type.

Utah Leasing Company's Flotation Plant at Newhouse, Utah (85224). H. H. Adams. Ills & flow sheets. 1800 w. Eng & Min JI—March 23, 1918. Reworking tailings in a 700-ton flotation plant.

The Effect of Addition Agents in Flotation (88259 N). Martin Harmon Thornberry and Horace Tharp Mann. Ills. 40 pp. Sch Mines & Met, Mo., Bul—Nov., 1917. Part 1st covers sulphates, hydroxides and nitrates.

The Ruth Flotation Machine (87859). Arthur J. Hoskin. Ills. 2000 w. Min & Sci Pr—July 27, 1918. Principle utilized; function of oil in frothing; results.

Flow Sheets

Determining Flow Sheets in New Mills (85969). A. Schwarz. 1500 w. Eng & Min JI—April 27, 1918. Importance of determining, before a mill is built, the method of concentration that will give the best results in dollars and cents.

Fumes

New Fume-Treatment Plant at Anaconda (87275). D. M. Brown. Ills. 1800 w. Min & Sci Pr—June 29, 1918. Smoke-treatment plant, estimated to cost \$2,000,000, including the largest chimney in the world, now under construction at Washoe smelter.

Furnaces

The New American Spirlet Roaster (88282 A). F. J. Harlow. Ills. 4000 w. Eng & Min JI—Aug. 17, 1918. Describes modifications adopted.

Hand-Sorting

Hand-sorting of Mill Feed (85804 D). R. S. Handy, with discussion. 5000 w. A I M E, Bul—April, 1918. Aims to determine under what conditions hand-sorting pays.

Heap-Leaching

Some Experiments in Heap-Leaching Copper Ores (84033). George D. Van Arsdale. Ills. 7000 w. Eng & Min JI—Feb. 2, 1918. Results of experiments to determine a successful method for treating porphyry ores containing less than 1¼ per cent. copper.

Laboratory

The Ore Dressing Laboratory of the Haileybury School of Mines (80409 N). A. E. Flynn. Ills. 1500 w. Can Min Inst, Bul—Oct., 1918. Details of plant and equipment.

ORE DRESSING

Screening

Leaching

The 2000-Ton Leaching Plant at Anaconda (85058). Frederick Laist and H. J. Maguire. Ills. 2500 w. Min & Sci Pr—March 16, 1918. Tailings amounting to 20,000,000 tons is to be treated.

Litigation

Similarities in the Legal Aspects of Some Flotation, Cyanidation, and Filtration Litigation (88875 N). R. C. Canby. 3500 w. Can Min Inst, Bul—Sept., 1918. Compares the McArthur-Forrest cyanide and the Moore filter cases with features of present flotation litigation.

Milling

Milling in Cyanide Solution (86299 A). A. W. Allen. 5000 w. Met & Chem Eng—May 15, 1918. A comparative analysis of the results of milling gold and silver ores in cyanide solution in place of alkaline water; and the relation of amalgamation in the selection of method.

Milling Plant

The United Eastern Mining and Milling Plant (82506 D). Otto Wartenweiler. Ills. 20 pp. A I M E, Bul—Nov., 1917. Details of a new reduction plant and its operation.

Milling Practice

Notes on Milling Practice at the McIntyre Mine, Porcupine, Ont. (84503 N). A. Dorfman. 17 pp. Can Min Inst, Trans—1917. Classes of ore with history of experiments resulting in successful methods.

Oliver Filter

Filter Adjustments at Packard Mill At Rochester, Nevada (88038 A). F. Dean Bradley. Ills. 1800 w. Eng & Min Jl—Aug. 3, 1918. Improvements.

Ore Dressing

East Pool Dressing Practice (83837 A). Flow-sheet. 1500 w. Min Mag—Dec., 1917. Present practice in dressing of Cornish tin—wolfram—arsenic ores.

Ore Pulp

The Automatic Separation of Solution from Solids in the Hydrometallurgical Treatment of Ore Pulps (87677 D). Bernard Macdonald. Ills. 4 pp. A I M E, Bul—July, 1918. Explains method, giving results.

Ore Treatment

Ore Treatment in Colorado (88522 A). Map. 2500 w. Eng & Min Jl—Aug. 31, 1918. Its position in the milling and metallurgical field.

Precipitation

Effect of Oxygen Upon the Precipitation of Metals From Cyanide Solutions (88205 D). Thomas B. Crowe. 4

pp. A I M E, Bul—Aug., 1918. Experimental investigations.

Electrostatic Precipitation (88207 D). O. H. Eschholz. Ills. 12 pp. A I M E, Bul—Aug., 1918. Describes systems of fume precipitation and applications.

Charcoal Precipitation of Gold-Bearing Cyanide Solutions (83248 N). H. G. Walton. Ills. 1200 w. Chem Eng & Min Rec—Nov., 1917. Results in Australia.

The Application of Charcoal to the Precipitation of Gold from its Solution in Cyanide (85098 N). H. R. Edmands. Ills. 25 pp. Instn Min & Met, Bul 161—Feb. 28, 1918. Investigations in the field of charcoal precipitation.

Quicksilver

Loss of Quicksilver in Gold Mills (85497). W. J. Sharwood. 1200 w. Min & Sci Pr—April 6, 1918. Tables of quicksilver consumption in important gold-mills.

Radium

Some Experiments on the Extraction of Radium from American Pitchblende Ores by Chlorination (85994 A). Mrs. Ray Cable and Herman Schlundt. 2500 w. Met & Chem Eng—May 1, 1918. Recovery was satisfactory for low, medium and high grade ores.

Recovery

Recovery of Selenium and Tellurium in Copper Refining (88657 A). M. H. Merriess and H. T. Binder. 2200 w. Eng & Min Jl—Sept. 7, 1918. Methods of recovery from electrolytic slime are suggested as practicable.

Refinery

Construction and Operation of an Electrolytic Copper Refinery (88357 A). J. E. McAllister. 4000 w. Eng & Min Jl—Aug. 24, 1918. Estimated cost.

Petroleum Refining (87483 B). C. W. Stratford, with discussion. Ills. 4500 w. S A E, Jl—July, 1918. Deals with the refining of Pennsylvania petroleum by steam distillation.

Roasting

The Humboldt Roasting Plant (84810). A. A. Watson. Ills. 800 w. Min & Sci Pr—March 9, 1918. Erecting, in Arizona, four Wedge roasting furnaces; capacity 150 tons per furnace daily.

Screening

Mechanical Screening of Wet Pulp (88663 A). H. E. McGraw. 2000 w. Eng & Min Jl—Sept. 21, 1918. Mechanical screening as a preliminary to concentration is recommended. Features of apparatus discussed.

ORE DRESSING

Tube Milling

Sampling

Chart for Tonnage-Sampling and Dilution-Control (85961). Hallet R. Robins. 500 w. *Min & Sci Pr*—April 27, 1918. Simplifying control of mill pulp dilution.

Separation

A New Method of Separating Materials of Different Specific Gravities (84343 D). Thomas M. Chance. Ills. 1500 w. *A I M E, Bul*—Feb., 1918. Describes an agitation method.

Silver

L'Argent Et La Guerre (82668 B). L. De Launay. 1900 w. *La Nature*—Nov. 3, 1917. Production of silver, and the war's effects.

Sintering

Sintering and Charge Delivery at the Bunker Hill Plant (89485 A). C. T. Rice. Ills. 3500 w. *Eng & Min JI*—Oct. 12, 1918. Third of a series of articles on the design and operation of the Bunker Hill & Sullivan smelter and refinery.

Smeltery

The Blast-Furnace Charge at the Bunker Hill Smeltery (88655 A). C. T. Rice. Second article of a series. Ills. 1500 w. *Eng & Min JI*—Sept. 7, 1918. Describes the composition of the charge and the handling of the various materials comprising it.

Ideal Layout for Silver-Lead Smeltery (87670 A). Guy C. Riddell. Ills. 6000 w. *Eng & Min JI*—July 20, 1918. Methods of lead smelting practice in the United States and Australia, with plans of an ideal plant.

Smelting

Mechanical Scotch-Hearth Smelting (87667 A). William E. Newnam. Ills. 1200 w. *Eng & Min JI*—July 20, 1918. Substitution of mechanical for hand-operated Scotch hearths, describing installations.

Notes on Recent Metallurgical Progress (87672 A). E. P. Mathewson. Ills. 8000 w. *Eng & Min JI*—July 20, 1918. Recent improvements at some of the great smelteries of the United States and Canada.

Safety Appliances in Smelteries and Refineries (87668 A). George M. Douglass. Ills. 3000 w. *Eng & Min JI*—July 20, 1918. Describes devices to prevent accidents.

Electric Plant at a Canadian Smelting Works (88134 A). Ills. 3500 w. *Engr*—July 12, 1918. Details of plant at Anyox, British Columbia.

Smelting Methods at El Paso (86,394). Courtenay De Kalb. Ills. 2500 w. *Min & Sci Pr*—May 18, 1918. Serial, 1st part. Receives copper and lead ores and concentrates from all over the south-west and northern Mexico.

The Partridge Smelting Furnace (84514 N). Allen R. Partridge. Ills. 1700 w. *Can Min Inst, Trans*—1917. Its construction and adaptability.

Blast-furnace Smelting at Stibnite with Considerations on the Metallurgy of Antimony (85099 N). W. R. Schoeller. 31 pp. *Instn Min & Met, Bul* 161—Feb. 28, 1918. Attempts made to smelt unroasted stibnite ores in water-jacketed blast furnaces. Review of metallurgical treatment of antimony ores.

Smelting and Ore-Sales Investigations in Colorado (85225). 6000 w. *Eng & Min JI*—March 23, 1918. Methods reviewed by O. R. Whitaker. Deals with factors affecting operation of lead-smelting rooms.

American Smelting v. Bunker Hill (82768). Abstract of affidavit by E. L. Newhouse, with editorial. 6500 w. *Min & Sci Pr*—Dec. 1, 1917. Serial, 1st part. Reviews causes leading to injunction suit, and development of modern methods of smelting, etc.

The New Smelting Works of the Mount Cuthbert Company (83247 N). Ills. 1200 w. *Chem Eng & Min Rev*—Nov., 1917. Detailed description of reduction works in Queensland.

The Partridge Smelting Furnace (82,392 N). Allen R. Partridge. Ills. 1500 w. *Can Min Inst, Bul*—Nov., 1917. Its construction and maintenance.

Standardization

The Distinction Between Extraction and Recovery (89677 A). A. W. Allen. 1500 w. *Eng & Min JI*—Oct. 26, 1918. Serial, 1st part. A plea for more scientific differentiation between terms used in hydrometallurgical operations.

Tailings

Ammonia Leaching of Copper Tailings at Kennecott, Alaska (82344). Horace M. Lawrence. Ills. 4500 w. *Eng & Min JI*—Nov. 3, 1917. Development of process; details and cost.

Tube-Milling

Artificial Pebbles for Tube-Milling (86745). A. W. Allen. Ills. 7800 w. *Eng & Min JI*—June 8, 1918. Use of flint pebbles in tube-mills and the substitution of other hard stones and rocks for the imported flints.

PRECIOUS METALLURGY

Gold

Africa

Les Mines D'Or Du Nord-Ouest De Madagascar (88405 E). E. Bernet. Ills. 3200 w. Mem Soc Ingénieurs Civils De France—Jan.-Mar., 1918. Location and estimated amounts of gold.

Assaying

Bone-Ash Cupels (82503 D). Frederic P. Dewey. 29 pp. A I M E, Bul—Nov., 1917. Gold and silver absorption in assaying are investigated.

Australia

Gold Mining in Western Australia (87771 N). Thomas Butement. Ills. 2500 w. Chem Eng & Min Rev—June 5, 1918. Serial, 1st part. The present position and outlook of the Kalgoorlie mines.

Bendigo

Factors Influencing Gold Deposition at Bendigo (85231 N). 2200 w. Onsd Gov Min JI—Feb., 1918. Summary from Bul. of the Advisory Council of Science and Industry.

Replacement in the Bendigo Quartz Veins and Its Relation to Gold Deposition (85054 B). F. L. Stillwell. Ills. 12 pp. Econ Geol—March, 1918. Investigation into the causes affecting the distribution of gold in quartz. General conclusions.

Bunker Hill

American Smelting v. Bunker Hill (82954). Affidavit by F. W. Bradley. 5500 w. Min & Sci Pr—Dec. 8, 1917. History of the efforts of Bunker Hill to market its products.

Cobalt, Ont.

Silver Deposition and Enrichment at Cobalt, Ont. (88314 B). J. A. Reid. Ills. 2200 w. Ec Geol—July, 1918. Critical discussion of paper by Dr. E. S. Bastin. Results of microscopic study.

Milling Practice at the Buffalo Mines, Cobalt, Ont. (84500 N). Robert E. Dye. 4500 w. Can Min Inst, Trans—1917. The methods employed and what they accomplish.

Cyaniding

Precipitation Electrolytique Des Solutions De Cyanure (83936 B). 3000 w. L'Industrie Electrique—Dec. 10, 1917. Methods of electrolytic precipitation of gold, silver and copper from cyanide solutions.

Cyanide Plant

Fine-grinding Cyanide Plant of Barnes-King Development Co. (88206 D). J. H. McCormick. Ills. 8 pp. A I M E, Bul—Aug., 1918. Details.

Decantation

Continuous Decantation at Yuanmi Gold Mines Limited (84697 N). V. T. Edquist. Ills. 1500 w. Chain Mines W Aust Mthly JI—Nov., 1917. Process and details of conversion of plant.

Diamonds

The Discovery of Diamonds in South Africa (88714 A). E. J. Dunn. 6000 w. Aust Min Std—July 18, 1918. Account of the discovery.

See same heading under Geology.

Dredge

Yuba No. 16 Double-Stacker Dredge (82790). Lewis H. Eddy. Ills. 1000 w. Eng & Min JI—Dec. 1, 1917. Details of one of the largest gold-placer dredges in the world, and the first double-stacker of its type.

Drift-Gravel

Drift-Gravel Mining in Eastern Siberia (86233). John Power Hutchins. Ills. 7 pp. Eng & Min JI—May 11, 1918. Account of these deposits and the crude methods of mining, transportation, milling, and sluicing.

Drilling

Drilling on the Lena Goldfield, Siberia (85374). W. E. Thorne. 4000 w. Min & Sci Pr—March 30, 1918. Lack of system; inefficiency of workmen; gold-stealing, etc.

Gold

Gold Dredging in the United States (89403 B). Charles Janin. Ills. 214 pp. U S Bur Mines—Bul. 127. Summarizes the development of the gold dredge, giving essential features of present-day dredges and methods.

The Aroroy Gold-Mining District (86080). E. H. Clausen. Ills. & Map. 3000 w. Min & Sci Pr—May 4, 1918. Mines in the Philippines; character of ore, etc.

The Gold Industry and Gold Standard (86234). Hennen Jennings. 7 pp. Eng & Min JI—May 11, 1918. Facts concerning production and the effect of present economic conditions on future output.

The Elko Prince Mine and Mill (88202 D). J. V. N. Dorr and L. D. Dougan. Ills. 20 pp. A I M E, Bul—Aug., 1918. Geology, development, mining and milling practice, power plant and construction costs.

The Vital Need for Gold (88359 A). John Clausen. 1800 w. Eng & Min JI—Aug. 24, 1918. Notes on the relation between specie and paper money.

The Matatchewan Gold Area (87039). A. G. Burrows. 3000 w. Can Min JI—June 15, 1918. Extracts from recent report on this Ontario field.

PRECIOUS METALLURGY

Roasting

Gold Deposits

Further Studies on the Deposition of Gold in Nature (86261 B). Victor Lenher. Ills. 7000 w. Ec Geol—May, 1918. Experimental studies and results.

Gold Industry

The Gold Industry and Gold Standard (86533). Hennen Jennings. 6000 w. Can Min JI—May 15, 1918. Review of the industry in the gold-producing countries and effect of present economic conditions.

The Gold Industry and the Gold Standard (86225). Hennen Jennings. Ills. 11 pp. Min & Sci Pr—May 11, 1918. Enormous increase in output; statistics; sources, cost, etc.

Gold Mining

Gold Mining Disabilities (88717 N). 7500 w. Cham Mines W Aust, Mthly JI—May 31, 1918. How war conditions and increased taxation have increased the disabilities of this industry so important for Australia.

The Crisis in Gold Production—Congress Must Act (87862 A). B. L. Thane. 3500 w. Eng & Min JI—July 27, 1918. Plea for the readjustment of the market value of gold on the basis of cost. Problems involved.

The Menace to Gold Mining (87860). 4500 w. Min & Sci Pr—July 27, 1918. Proposal for re-habilitation of gold; testimony of Hennen Jennings before the Ways and Means Committee.

Imposts on Gold Mining (85372 N). 5500 w. Cham Mines W. Aust, Mthly JI—Dec., 1917. Critical discussion of the treatment given the gold mining industry in Australia.

See also Quicksilver, under Ore Dressing.

Gold Recovery

The Sodium Sulphide Process of Gold Recovery (88233 N). F. Wartenweiler. 15 pp. Instn Min & Met, Bul 166—July 25, 1918. Outlines metallurgy at Prestea mine, West Africa.

India

Air Blasts in the Kolar Gold Field, India (89570 D). 5000 w. A I M E, Bul—Oct., 1918. Discussion of E. S. Moore's paper.

Air Blasts in the Kolar Gold Field, India (84967 D). E. S. Moore. 3000 w. A I M E, Bul—March, 1918. Geological formations, description of air blasts, their origin, conclusions, etc.

Oxidized Gold Ore

Solving the Ore Treatment Problem at White Caps Mine (82602). John G. Kirchen. Ills. 1500 w. Eng & Min JI—Nov. 24, 1917. Peculiar mineralogical

composition of the ore caused fouling of the solution. Trouble mainly in the stibnite present. How the problem was solved.

Platinum

Recovery of Platinum in Gold-Dredging (82953). James W. Neill. Ills. 2500 w. Min & Sci Pr—Dec. 8, 1917. Methods of recovery; causes of loss; improvements in concentration.

How Draper Brought Out the Platinum (85032). 2500 w. Eng & Min JI—March 16, 1918. Account by F. W. Draper in Bul. 116, Jan. 31, 1918, M. M. S. A.

Precipitation

Charcoal Precipitation of Auro-cyanide (86900 A). A. W. Allen. Ills. 1800 w. Met & Chem Eng—June 15, 1918. The new Moore-Edwards process, with discussion of the underlying theories.

Charcoal Precipitation of Gold-Bearing Cyanide Solutions (83633 N). H. G. Walton. Ills. 1000 w. Chem Eng & Min Rev—Nov. 5, 1917. Report of department of mines, Western Australia, for year 1916.

Sodium Sulphide Precipitation of Silver at the Nipissing Mine (84499 N). R. B. Watson. 1500 w. Can Min Inst, Trans—1917. Its use and cost.

Pyrite

Pyrite Mining at Kershaw, South Carolina (88961 A). Joel H. Watkins. Ills. 3500 w. Eng & Min JI—Sept. 21, 1918. The old Haile gold mine being worked for production of pyrite ore.

Queensland

The Recent Gold Rush at Kin Kin, near Gympie (85226 N). Lionel C. Ball. Map & Ills. 1500 w. Onsd Gov Min JI—Feb., 1918. Information concerning the prospects.

Rand

Some Aspects of Rand Mining (83282). 2000 w. Eng & Min JI—Dec. 29, 1917. Extract from Lord Harris' speech concerning difficulties under which gold-mining is now being conducted.

Redredging

Redredging—Will It Pay? (83483). Walter H. Gardner. Ills. 1500 w. Eng & Min JI—Jan. 5, 1918. Discusses attempts to redredge areas in California.

Roasting

Roasting for Amalgamating and Cyaniding Cripple Creek Sulpho-telluride Gold Ores (88204 D). A. L. Blomfield, and M. J. Trott. Ills. 14 pp. A I M E, Bul—Aug., 1918. Details of roasting furnaces and conditions, etc.

MISCELLANY

Prospecting

Russia

Irtysh Corporation Developments in Siberia and the Russian Internal Situation (84216). 6000 w. Eng & Min J1—Feb. 9, 1918. Leslie Urquhart reviews Russia's present internal condition and the important mining and smelting operations in the Altai region.

Silver

The Halogen Salts of Silver at Wonder, Nevada (83048 B). J. A. Burgess. 1500 w. Ec-Geol—Oct.-Nov., 1917. Geology occurrence, etc.

An American Policy Regarding Silver (85220). Emmet D. Boyle and Whitman Symmes. 1200 w. Min & Sci

Pr—March 23, 1918. Sources of silver; contrast between international economic policy of Great Britain and America.

Notes Concerning Local Treatment for Certain West Kootenay Silver Ores (84504 N). Francis A. Thomson. 1500 w. Can Min Inst, Trans—1917. Results of tests on silver ores.

Witwatersrand

Witwatersrand Gold Fields (85249 N). 8 pp. S Af Inst Elec Engrs, Trans—Dec., 1917. Recommendations concerning A. C. Sub-stations operating at working pressures exceeding 250 volts.

MISCELLANY

Briquetting

Briquetting of Non-Ferrous Light Metal Scrap (82446 F). A. L. Stillman. Ills. 3500 w. A I Met, J1—Sept., 1917. Things of importance in the manufacture; details of the Ronay press and process.

Metallurgy

Recent Advances in Canadian Metallurgy (85698 N). Alfred Stansfield. 3500 w. Can Soc C E—March 28, 1918. Advances since the commencement of the war.

Mineral Industry

The Mineral Industry After the War (86904 N). Alfred W. G. Wilson. 4000 w. Can Min Inst, Bul—June, 1918. A study of possible commercial development in Canada.

Minerals

The War-Minerals Bill (87274). 11 pp. Min & Sci Pr—June 29, 1918. Testimony given by Van H. Manning, Director of U. S. Bureau of Mines, before the Committee on Mines and Mining of the House of Representatives.

Mines Report

Gild, Silver, Copper, Lead, and Zinc in the Eastern States in 1917 (88059). James M. Hill, with prefatory note by H. D. McCaskey. 10 pp. U S Geol Surv, 1:6—July 29, 1918. Prices, etc.

Mine Report

Seventh Annual Report by the Director of the Bureau of Mines to the Secretary of the Interior for the Fiscal Year Ended June 30, 1917 (82929). Van H. Manning. 104 pp. U S Bur Mines—Dec., 1917.

Gold, Silver, Copper, Lead and Zinc in California and Oregon in 1916 (83-156 N). Charles G. Yale. 55 pp. U S Geol Surv, 1:8—Dec. 3, 1917. Statistics of production by counties.

Mine Taxation

The Incidence of Taxation upon Metaliferous Mining in the British Isles (85787 N). Henry Louis. 4000 w. Instn Min & Met, Bul. 160—Jan. 10, 1918. Reviews the effect upon the mining industry of the principal taxes upon mining and minerals.

Mining Industry

The Mining Industry: The Keystone of Modern Civilization (86792). R. H. Stretch. Ills. 4500 w. Min & Sci Pr—June 8, 1918. Reviews the history and development, and the future possibilities.

The Mining Industry in Relation to the Military Service Act (84894 N). Norman R. Fisher. 3000 w. Can Min Inst, Bul—March, 1918. Editorial letter stating the case of the silver mining industry of Northern Ontario.

The Government and the Mining Industry (84892 N). 3000 w. Can Min Inst, Bul—March, 1918. Text of a memorandum recently submitted to the Prime Minister of Canada.

Mineral Industry

The Mineral Industry After the War (84893 N). Alfred W. G. Wilson. Excerpts from a paper read at Montreal. 2500 w. Can Min Inst, Bul—March, 1918. Reviews Canadian position and problems.

Mining Debris

Hydraulic-Mining Debris in the Sierra Nevada (85059). G. K. Gilbert. Ills. 2800 w. Min & Sci Pr—March 16, 1918. Discussion on the quantity and ultimate deposition.

Prospecting

Hints on Prospecting for a Few Canadian Minerals (88193 N). Wyatt Malcolm. 12 pp. Can Min Inst, Bul—Aug., 1918. Suggestions.

MISCELLANY

Year Book

Radium

Radium (88197 D). Richard B. Moore. 17 pp. A I M E, Bul—Aug., 1918. History, ore deposit, treatment, uses, etc.

U. S. Bureau of Mines

Activities of the U. S. Bureau of Mines for Year Ended June 30, 1917 (83191). 2500 w. Eng & Min J1—

Dec. 22, 1917. Summary of the year's work in relation to the mining industry.

Year Book

Year Book of the Bureau of Mines, 1916 (82589 A). Van. H. Manning. Ills. 165 pp. U S Bur Mines—Bul. 141. Investigations in mining and metallurgy. More important work of the Bureau during the year.

RAILWAY ENGINEERING

CONDUCTING TRANSPORTATION..	349	ROADS AND PROJECTS	370
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CONDUCTING TRANSPORTATION

Discipline

Administration

Doings of the United States Railroad Administration (86631). 5000 w. Ry Age—May 31, 1918. Serial, 1st part. Bituminous coal prices; the federal managers; standardization of operating statistics.

Activities of the Railroad Administration (86095). 2200 w. Ry Sig Engr—May, 1918. Chart and summary of orders issued and progress made.

Doings of the United States Railroad Administration (86321). 5500 w. Ry Age—May 17, 1918. Rate increases; proposed amalgamation of railroad associations; information for shippers.

Batteries

Batteries and Switchboards (85085 C). 1000 w. Ry Sig Assn, JI—March, 1918. Directions for installation of lead type stationary storage battery.

British Railways

British Railways Under War Conditions (89338 A). 2500 w. Engr—Sept. 13, 1918. Serial, 1st part. The present number deals with legislative connection between the railways and the naval and military authorities.

Canada

Brain-Racking Problems for Canadian Roads (85443). J. L. Payne. 2000 w. Ry Age—April 5, 1918. Severe winter; shortage of equipment; unprecedented business.

Railway Progress in Canada During the Year 1917 (83463 A). J. L. Payne. Ills. 2500 w. Ry Age—Jan. 4, 1918. (Special No.) Roads worked under heavy pressure with shortage of labor.

Car Distributor

The Passenger Car Distributor and His War Job (86058). John W. Roberts. 1500 w. Ry Age—May 3, 1918. Important task of troop movements.

Car Service

Principles and Practices of Car Service Regulation. H. E. Byram. Also, Regulation of Car Service Under Government Control of Operation. John J. Esch

(85640 D). 17 pp. An Am Acad—March, 1918. Economic and financial phases; equipment problems; traffic possibilities.

Coal Distribution

The New Zone System of Coal Distribution (85154). 4000 w. Ry Age—March 22, 1918. Plan for avoiding cross hauling of coal.

Coaling

A New Design for Engine Coaling Facilities (89259). Ills. 1200 w. Ry Age—Oct. 4, 1918. Economies effected in track capacity and car supply on the Erie.

Collision

Rear End Collision at Ivanhoe, Ind., on Michigan Central (87223). Ills. 1000 w. Ry Age—June 28, 1918. Account of collision with circus train, killing 78 and injuring 120.

Side Collision Between Passenger Trains (83626). Ills. 3500 w. Ry Sig Engr—Jan., 1918. Abstract of report on the wreck at Larmond, Va.

Commissions

Regional Railroad Commissions: Their Relation to the State Commissions and to the Interstate Commission (85657 D). J. E. Love. 2000 w. An Am Acad—March, 1918. Theoretical discussion.

Co-ordination

Co-ordination of All Transportation Facilities (85436). John R. Hall. 3800 w. Ry Age—April 5, 1918. The waste of competition, and the opportunity for combination.

Delay

Delay in Train Movements (86103 A). Walter V. Turner. 1400 w. Ry & Loc Eng—May, 1918. Relation of various rates of retardation and acceleration to multiplication of initial delay in train movements into final or resultant delay.

Discipline

Discipline in the Signal Department (84654). Robert B. Elsworth. 1800 w. Ry Age—March 1, 1918. Considers the fundamental requirements of discipline.

Consult Classification of the Index. See page 9.

Efficiency CONDUCTING TRANSPORTATION Government Operation

The Brown System of Discipline (82741). Sidney J. Keeler. 2500 w. Ry Age Gaz—Nov. 30, 1917. Studies by an employee of fifteen years' experience on both large and small roads.

Railroad Discipline Without Suspensions (82473). E. H. Heath. 3000 w. Ry Age Gaz—Nov. 16, 1917. Remarks on the Brown system.

Efficiency

American Railway Efficiency During the War (83462 A). 4500 w. Ry Age—Jan. 4, 1918. (Special No.) Reviews accomplishments and increased service in nine months since U. S. entered conflict.

Electric Traction

La Trazione Elettrica (85867 B). F. Tajani. 6700 w. L'Industria—Feb. 15, 1918. Economic and mechanical advantages of electric operation of Italian railways.

Engineers

Will Railroads Experience a Shortage of Engineers? (80427) 1500 w. Ry Age—Oct. 11, 1918. Discussion based on data from railroads and technical schools.

Federal Control

What the Future Holds in Store for the Railroads (80260). 3000 w. Ry Age—Oct. 4, 1918. Views of Samuel Untermyer and of Francis H. Sisson on effect of Federal control on securities and fate of carriers after war.

France

Operation the U. S. Military Railways in France (88042). J. G. Porter. Ills. 3500 w. Ry Age—Sept. 20, 1918. How Americans adapted themselves to conditions encountered.

La Nouvelle Organisation du Contrôle des Chemins de Fer (85126 B). J. Trévières. 3200 w. Le Génie Civil—Feb. 9, 1918. New regulations for French railways. Decree of Jan. 8, 1918.

German Railways

Germany's Railway Situation Is Most Serious (84650). 3500 w. Ry Age—March 1, 1918. Prussia's railroads had a deficit of \$50,000,000 in 1917.

Government Control

British Railway Labor, Wages, and Living Under Government Control (87010). 5000 w. Ry Rev—June 15, 1918. Summary of British railway experience from report of the railroad wage commission.

Synopsis of Mr. George A. Post's Address (86820 A). 2500 w. Ry & Loc Eng—June, 1918. Salient features of an address at meeting of the Railway Business Assn.

Italian Railways Under Government Management (86054). Map & Ills. 2500 w. Ry Age—May 3, 1918. Serial, 1st part. Value of unified direction exemplified as a war measure.

First Three Months of Government Control (85438). 6000 w. Ry Age—April 5, 1918. Policies being developed for welding railroads into a single system.

Federal Control of Railroads in War Time (85639 D). Max Thelen. 3500 w. An Am Acad—March, 1918. Problems with which the railroads have been confronted during the war, and results expected from government operation.

Nation's Railroads Now Under Government Control (83461 A). Also editorial. Photographs. 10000 w. Ry Age—Jan. 4, 1918. (Special No.) Details of new organization. Probable changes.

President Wilson Takes Over Railroads (83245). 1400 w. Ry Age Gaz—Dec. 28, 1917. Assuming government control of railways in the United States.

McAdoo's Instructions to Regional Directors (84645). 2200 w. Ry Age—March 1, 1918. Outline of their functions and of policy of Director General for operation under government control.

Precedents for Private Ownership and Government Operation of Transportation Facilities (85643 D). Defos F. Wilcox. 13 pp. An Am Acad—March, 1918. Experience in Europe, with discussion of administration bill before the U. S. Congress.

Government Operation

Government Operation of American Railroads (85644 D). Clifford Thorne. 26 pp. An Am Acad—March, 1918. Outlines some of the essentials of the plan now before the U. S. Congress, and how the plan differs from the one adopted in Great Britain.

Government Operation of Railroads: Legal Aspects (85434). Roberts Walker. 3000 w. Ry Age—April 5, 1918. Owner's and creditor's rights subordinated to Government.

Director General of Railroads McAdoo on the Job (83541). 4500 w. Ry Age—Jan. 10, 1918. "Freight-moving-week" ordered; demurrage rates increased; passenger service curtailed.

Running the Railroads Under the New Regime (83680). 4500 w. Ry Age—Jan. 18, 1918. Freight moving week; status of the I. C. C. and the State commissions; wages and mail service.

Railroad Administration CONDUCTING TRANSPORTATION Railroad Administration

Government Operation of Railways Imminent (83024). With editorial. 7000 w. Ry Age Gaz—Dec. 14, 1917. Discusses the proposed plan, its advantages and disadvantages.

The British Railways Under Government Control (83147). F. A. McKenzie. 4500 w. Ry Age Gaz—Dec. 21, 1917. Problems Great Britain has solved.

Government Ownership

Government Ownership of the Railroads (85702 A). W. A. Clark. 3000 w. Af Eng Soc Min, Bul—April, 1918. Opposed to government ownership, outlining some of the dangers.

The Necessity for Public Ownership of the Railways (85651 D). Frederic C. Howe. 10 pp. An Am Acad—March, 1918. Favorable to government ownership.

What Government Ownership Would Mean (85439). Samuel O. Dunn. 5500 w. Ry Age—April 5, 1918. Address before Buffalo Club. Effect on other businesses.

Halifax Disaster

Salvaging the Railway Facilities at Halifax, N. S. (86322). F. B. Tapley. Ills. 2200 w. Ry Age—May 17, 1918. Account of the damage done by the disaster of Dec., 1917, and the work of restoration.

Interlocking

Power Interlocking (85086 C). Ills. 700 w. Ry Sig Assn, JI—March, 1918. Typical circuits, and requisites for first range voltage electric interlocking.

Electro - Pneumatic Interlocking Plants (88001). H. A. Wallace. (Abstract.) 4000 w. Ry Sig Engr—Aug., 1918. Details of construction and operation.

New D. L. & W. Interlocking in Buffalo (82252). B. T. Anderson. Ills. 1500 w. Ry Sig Engr—Nov., 1917. Old mechanical plant rebuilt.

Italy

Il Problema Ferroviario Nel Dopo-Guerra (85106 B). G. Prato. 4200 w. Industria—Jan. 31, 1918. The status of the Italian State railways after the war.

Risultati Finanziari Dell' Esercizio Delle Ferrovie Italiane Di Stato (87105 B). 5400 w. Monitore Tecnico—Mar. 30, 1918. Financial operating results of Italian State Railways. 1905-6 compared with 1915-16.

Legislation

The Problem of the Short Line Railroads (86170). Sanford H. E. Freund. 3000 w. Ry Age—May 10, 1918. The intent of the legislation regarding their

disposition and operation during federal control.

Light Traffic

Les Chemins De Fer A Faible Trafic (84506 B). Claise. 4000 w. Le Génie Civil—Dec. 29, 1917. Suggestions for conducting railways of light traffic after the war. Reducing the working force and operating expenses.

N. W. Region

N. W. Region; A Group of Well-Managed Roads (88813). Photographs. 2500 w. Ry Age—Sept. 13, 1918. Ranks high in earning capacity and operating efficiency.

Operation

Activities of the Director-General (84861 A). 3500 w. Ry Mech Engr—March, 1918. New appointments; standard car and locomotive committees; labor.

Report of Committee XXI—On Economics of Railway Operation (85016 C). 44 pp. Am Ry Eng Assn, Bul—Jan., 1918. Brief report with extensive bibliography.

Pennsylvania R. R.

A Year of New Records, Emergencies and Changing Conditions (84809). Ills. 2500 w. Ry Rev—March 9, 1918. From report for 1917.

Pooling

Pooling Railroad Equipment and Facilities (83026). Samuel G. Thomson. 3500 w. Ry Age Gaz—Dec. 14, 1917. Physical problems of pooling equipment and the needlessness of government control.

Eastern Railroads to Be Pooled (82,736). Also editorial. 2500 w. Ry Age Gaz—Nov. 30, 1917. Measures to relieve congestion.

Post War Control

Control of Railroads After the War (85648 D). Henry A. Palmer. 2500 w. An Am Acad—March, 1918. Opinions regarding public policy reforms needed; pooling, etc.

A Suggested Plan for Permanent Governmental Supervision of Railroad Operation After the War (85650 D). Alexander W. Smith. 5000 w. An Am Acad—March, 1918. Suggests a permanent federal railroad board.

Present Crisis

Our Transportation in the Present Crisis (85419 A). John F. Lent, with discussion. 6000 w. Ry Cb Pitts, Pro—Feb. 21, 1918. Transportation problems in America during the war.

Railroad Administration

Doings of the United States Railroad Administration (85893). 7500 w. Ry Age—April 26, 1918. Recent important developments.

CONDUCTING TRANSPORTATION

Railway Personnel

Railway Personnel Under Government Control (85746). 2500 w. Ry Age—April 19, 1918. Policy of the railroad administration.

Railroad Problems

Railroad Problems and Conditions Growing Out of the War (83338 A). R. H. Ashton. 3500 w. West Ry Cb, Pro—Nov. 19, 1917. Reviews the work accomplished by railroads in the United States under the War Board.

The American Railroads in War Time (82599). Hale Holden. 1800 w. Ry Age Gaz—Nov. 23, 1917. Address before the Nat. Ind. Traffic League, New York City. Review of War Board's problems.

Railway Problem

Evolution of the Railway Problem (82904). 1800 w. Ry Rev—Dec. 8, 1917. Serial, 1st part. Editorial discussion of the present railway conditions.

Reorganization

Results of Signal Department Reorganization on Rock Island (88102). J. Arthur Hofmann. 1200 w. Ry Age—Aug. 9, 1918. Saving effected.

Russia

The Railway Situation in Russia (82-739). 2500 w. Ry Age Gaz—Nov. 30, 1917. Interview with Henry Miller. Describes conditions and gives recommendations.

Signaling

Winter Maintenance of Primary and Storage Battery (89389). A. G. Shaver. 1700 w. Ry Sig Engr—Oct., 1918. Pointers on winter work covering the various types, condition of the track, etc.

Maintenance of Electric Interlocking in Winter (89390). A. W. Seymour. 1200 w. Ry Sig Engr—Oct., 1918. Methods in practice. Preparations for winter.

Missouri Pacific Signal Installation (85498). O. R. Unger. Ills. 1200 w. Ry Sig Engr—April, 1918. New construction methods.

Development of Electric Interlocking (85499). W. S. Henry. Abstract of paper read at Houston, Texas. 4500 w. Ry Sig Engr—April, 1918. Information concerning early development.

Signal Department Encounters New Problems (85442). 2500 w. Ry Age—April 5, 1918. Shortage of labor and delayed deliveries of materials hinder work.

Interborough Rapid Transit Electro-Pneumatic Plant (84310). Charles McGregor. Ills. 3000 w. Ry Sig Engr—Feb., 1918. Arrangement of signals and interlocking to care for three track junction

tion in connection with the extension of N. Y. subway system.

Electrical Signalling and Control on Railways (84493 N). C. M. Jacobs. Ills. 3500 w. Instn E E—Jan. 15, 1918. Indications, track circuit, single line working, power, and limitations.

Physically and Mentally Protected (84076 A). Ills. 1200 w. Ry & Loc Eng—Feb., 1918. Action of stop signals for train protection.

Use of Electric Fouling Bars in England (82940). T. S. Lascelles. Ills. 1500 w. Ry Sig Engr—Dec., 1917. Device applied in cases where the conditions would render track circuits of doubtful value.

Proceedings of the Annual Meeting of the Railway Signal Association, Sept. 18 and 19, 1917 (83166 C). 165 pp. Ry Sig Assn, JI—Dec., 1917. Reports, discussions, etc., at Atlantic City, N. J.

Automatic Signals and the Automatic Stop (82845 A). From a paper by L. E. Jones read before the Pacific Ry Club. 3500 w. Ry & Loc Eng—Dec., 1917. Essentials of the automatic signal; systems, etc.

Light Signals on the Southern Pacific (82939). J. P. Robinson. Ills. 2500 w. Ry Sig Engr—Dec., 1917. Stock material utilized for a 7-mile installation.

Some Impressions of Continental Signalling Practice (82575 A). R. S. Griffiths. Read before Instn. of Ry. Sig. Engrs. Ills. 4500 w. Ry Engr—Nov., 1917. Particularly installations for single lines.

Signaling

Progress in Railroad Signaling During the Year (83469 A). Ills. 6 pp. Ry Age—Jan. 4, 1918. (Special No.) Marked progress in interlocking.

Review of Signaling in the Past Year (83625). 9 pp. Ry Sig Engr—Jan., 1918. Record of block signals and interlockings completed, under construction, and contemplated.

Signalling and Interlocking of Keadby Railway and Bridge (84840 A). James Benjamin Ball. Ills. 3500 w. Engrng—Feb. 15, 1918. Serial, 1st part. Read before Inst. of Civ. Engrs.

Signaling Practice (85087 C). Ills. 30 pp. Ry Sig Assn, JI—March, 1918. Report of Committee X.

Alternating Current Automatic Block Signaling (85088 C). 10 pp. Ry Sig Assn, JI—March, 1918. Specifications for a.c. motor semaphore signals.

A. C. Automatic Signal Work on the Monongahela (84866). George H. Burnette. Ills. 1200 w. Ry Sig Engr—

Signals**CONDUCTING TRANSPORTATION****Terminals**

March, 1918. Describes installation, discussing problems encountered.

Discussion on "Electrical Signalling and Control on Railways" (85247 N). 6 pp. Instn E E, JI—March, 1918. Paper by C. M. Jacobs. Continued discussion.

Methods of Pole Line Construction (84867). J. C. Martine. Ills. 1700 w. Ry Sig Engr—March, 1918. Common faults and means of overcoming them.

Signaling Practice (88998 C). Ills. 60 pp. Ry Sig Assn, JI—Sept., 1918. Reports of committees on mechanical interlocking, standard designs, A. C. automatic block signaling, signaling practice, etc.

How Motor Cars Can Increase Efficiency (88000). J. Arthur Hofmann. Ills. 1000 w. Ry Sig Engr—Aug., 1918. Results of reorganization of the signal department on the C., R. I. & P.

Duties of a Signal Linesman (88167 N). H. Kirk. 2500 w. Per-Way Instn, JI—April, 1918. Account of duties and brief description of apparatus in his care.

New Mechanical Plant on Chicago & Alton (87998). Ills. 2500 w. Ry Sig Engr—Aug., 1918. An interlocker on a double-track main line, crossing single-track road, so designed that no night-leverman is required.

Railway Signal Practice on French Lines (87999). J. G. Porter. Ills. 1700 w. Ry Sig Engr—Aug., 1918. Interlocking towers and machines; signaling between stations.

Signals

Position-Light Signals on Pennsylvania Railroad (87803). Ills. 1000 w. Ry Age—July 26, 1918. Use of this type being extended.

A. P. B. Light Signals on Union Traction of Indiana (86094). Ills. 2200 w. Ry Sig Engr—May, 1918. Details of a recently completed installation in Indiana.

The Interpretation of the Caution Signal (86097). F. H. Nicholson. Diagrams. 1500 w. Ry Sig Engr—May, 1918. Shows the relation between train-handling practice and the observance of the indication.

Report of Committee X—On Signals and Interlocking (83805 C). Ills. 27 pp. Am Ry Eng Assn, Bul—Nov., 1917.

Interesting Signal Installation on Central of Georgia (87371). W. D. Cloud. Ills. 2500 w. Ry Sig Engr—July, 1918. Methods employed to reduce labor on the line.

The Use of Signals for Train Operation (87370). Henry M. Sperry. Ills.

5000 w. Ry Sig Engr—July, 1918. How power-operated three-position train order signals on the Erie in connection with automatics helps train movements.

Frost and Moisture in Signal Mechanism and Motor Cases (85089 C). 8 pp. Ry Sig Assn, JI—March, 1918. Report of Albany regional committee.

Inspection of Signal Apparatus (85090 C). A. B. du Bray. 10 pp. Ry Sig Assn, JI—March, 1918. Report of Kansas City regional committee.

Snow

Pulling the Chicago Terminals Out of the Snow (84270). Ills. 1500 w. Ry Age—Feb. 15, 1918. Work of restoring traffic after the January blizzard.

Recent Operating Difficulties on Pennsylvania R. R. (84694). Ills. 2500 w. Ry Rev—March 2, 1918. From report of Elisha Lee to the president of the Pennsylvania R. R. Account of difficulties due to unusually severe winter weather.

The Pennsylvania's Fight with Jack Frost and the Snow Banks (84646). Ills. 2000 w. Ry Age—March 1, 1918. Abstract of report of Elisha Lee of experiences on lines east of Pittsburgh.

Standardization

Chamber of Commerce of U. S. Sounds Warning (85742). 10000 w. Ry Age—April 19, 1918. Papers and discussions on the transportation problem and the operation of transportation facilities of the U. S. after the conclusion of government control.

Swiss Railways

Results of the Operation of the Berne-Loetschberg-Simplon Railway (86613). From *Le Genie Civil*. 2000 w. Eng & Con—May 29, 1918. Report of trials, by M. L. Thorwan, of this single-phase electric line.

Switches

Hand Point Levers (88166 N). E. Treacher. Ills. 6 pp. Per-Way Instn, JI—April, 1918. Up-to-date fittings now in use in England.

Terminal Facilities

Increase Engine Terminal Output (83732 A). Articles by F. P. Roesch, E. J. Harrison, F. W. Taylor, John C. Murdock. 2500 w. Ry Mech Engr—Jan., 1918. Suggestions for improving facilities.

Terminals

Two Large Railway Terminals Under Construction (86166). Ills. 2500 w. Ry Age—May 10, 1918. Novel features in yards being built by the Illinois Central and the New Haven.

Track Circuits

Decreasing Engine Terminal Delay (83044 A). 5000 w. Three prize papers. *Ry Mech Engr*—Dec., 1917. The need of organization and supervision.

Track Circuits

A Graphical Method of Solving D. C. Track-Circuit Problems (87883 A). H. M. Proud. Read before Instn. Ry. Sig. Engrs. 3500 w. *Ry Engr*—July, 1918. Serial, 1st part. Reviews previous methods of calculating and explains method devised by author.

Track Insulation

Some Tests on Fiber Used for Track Insulation (86096). G. Horatio Packwood, Jr. Ills. 2000 w. *Ry Sig Engr*—May, 1918. Specifications covering methods employed, with results and conclusions.

Train Control

New Train Control System on Great Eastern of England (82253). T. S. Lascelles. Ills. 1600 w. *Ry Sig Engr*—Nov., 1917. System, in experimental operation, designed by E. S. Tiddeman.

Train Control

Maximum Speed Retardation and Rail Conditions as Related to Control of Trains (83549 A). Walter V. Turner. 5000 w. *Ry & Loc Eng*—Jan., 1918. How to realize the best economy in the control of trains.

Train Handling

See also Compensation, Railway Finance, Railroad Securities and Valuation, under INDUSTRIAL MANAGEMENT, *Finance and Costs*; and Administration Bill, under Regulation.

Train Handling (83473). G. H. Wood. 2200 w. *Ry Rev*—Jan. 5, 1918. From *Santa Fe Emp. Mag.* Advocates increased piston travel and careful draw gear inspection.

Train Movement

Headway or Spacing of Trains (84081 A). Walter V. Turner. 1800 w. *Ry & Loc Eng*—Feb., 1918. Systems in use.

Train Shocks

Shocks in Long Passenger Trains (89405 A). Robert Burgess, with discussion. 13 pp. S & S W Ry Cb, Pro—July, 1918. Analysis of shocks due to deceleration and to acceleration.

Transfer Railroads

Operating Methods of Transfer Railroads (89298). 3500 w. *Ry Rev*—Oct. 5, 1918. Analysis of existing conditions and suggestions for improvements. From paper by E. H. Lee to Am. Ry. Eng. Assn.

CONDUCTING TRANSPORTATION Winter Maintenance

Transport

Railways and the War Cabinet Report (86222 A). 2500 w. *Engr*—April 19, 1918. The accomplishments of over sea transport; railways, and their work; canals, etc.

A New System of Transport (87888 A). Frank Dutton. Ills. 3000 w. *Engr*—June 28, 1918. General review of articles on Road and Rail Transport, appearing in the *South African Railways and Harbours Magazine*.

Transportation

Secretary Redfield on the Trinity of Transportation (89465). William C. Redfield. 3000 w. *Mfrs' Rec*—Oct. 10, 1918. Address before the Regional Chairmen of the Highway Transport Committee of the Council of National Defense. Importance of railway, waterway and highway transportation.

Traveling Engineers

Traveling Engineers' Convention (89443 A). 11 pp. *Ry Mech Engr*—Oct., 1918. Fuel conservation and other important problems discussed at Chicago. Addresses, reports, etc.

Troop Trains

A Novel Scheme for Carrying Troops by Rail (88815). Frederick C. Coleman. Ills. 1500 w. *Ry Age*—Sept. 13, 1918. Military cars used by the Indian Peninsula Ry. are described.

U. S. Administration

Organization of Government Railroad Administration (88784 A). 2000 w. *Eng News-Rec*—Sept. 12, 1918. Chart and explanatory data.

Director General McAdoo Reports to the President (88812). 6000 w. *Ry Age*—Sept. 13, 1918. Work of the U. S. railroad administration for the first seven months.

U. S. Railroads

Doings of the United States Railroad Administration (86738). 6000 w. *Ry Age*—June 7, 1918. Serial, 1st part. First appointments of federal managers. Shop labor troubles.

War Railways

War and the Railways (83268). Leslie F. Van Hagan. Lectures. 16 pp. *Wis Engr*—Dec., 1917. Handling of troops and supplies at the front; and the handling of freight traffic.

Winter Maintenance

Winter Maintenance of Lamps, Motor Cars and Tools (89392). Caleb Drake. 2000 w. *Ry Sig Engr*—Oct., 1918. Care needed; suggestions.

MOTIVE POWER AND EQUIPMENT

Cars

Air Brakes

A 100-Car Test of the Automatic Straight Air Brake (87802). Ills. 3000 w. Ry Age—July 26, 1918. Runs on the Virginian railway to demonstrate the ability of the A. S. A. equipment to handle the longest trains operated under any conditions.

Road Tests of the A. S. A. Brake (88,013 A). Ills. 3500 w. Ry Mech Engr—Aug., 1918. 100-car train run on Virginian with A. S. A. and combination of A. S. A. and Westinghouse brakes.

Test of the Automatic Straight Air Brake on the Virginian Railway (88122 A). Ills. 3300 w. Ry & Loc Eng—Aug., 1918. Recent tests which have shown the possibilities of the air brake for rapidity and reliability of action.

Actual Value of Improved Brake Equipments for Electric Service (87432 A). Walter V. Turner. 1800 w. Ry & Loc Eng—July, 1918. Points out the potential value of improved types.

Freight Brake Maintenance (87437 A). F. B. Farmer. 4000 w. Ry Mech Engr—July, 1918. Importance of efficient brakes in transportation problems.

Brake Conditions in General Freight Service and Their Relations to Shocks and Break-in-Twos (86253 N). H. F. Wood, with discussion. 36 pp. N E Rd Cb—Apr. 9, 1918. Air-brakes, their design, maintenance, care, etc.

Cleaning and Lubricating Brake Cylinders (84080 A). 1400 w. Ry & Loc Eng—Feb., 1918. Directions.

The Automatic Straight Air Brake (82250 A). Ills. 1500 w. Ry & Loc Eng—Nov., 1917. Details of a new system of air brake mechanism.

Train Lengths and Volume of Air Required for Brake Operation (82847 A). Walter V. Turner. 1000 w. Ry & Loc Eng—Dec., 1917. Gives formula for calculations of train stops and control of trains on grades, and action of brake equipments.

Air Brake Convention Proceedings (86564 A). 6000 w. Ry Mech Engr—June, 1918. Papers dealing with prevention of break-in-twos and slack action in passenger trains.

Feed Valve Maintenance (86918). W. Clegg. Ills. 1800 w. Ry Rev—June 8, 1918. A system for keeping air brake feed valves in working condition.

British Ambulance Train for American Wounded (84161). Ills. 1000 w. Ry Age—Feb. 8, 1918. The Midland Ry. of England has built a 16-car train.

Ambulance Trains

Two Ambulance Trains for the United States Army (87508). Ills. 700 w. Ry Age—July 12, 1918. Trains built by the Great Western of England.

Ambulance Trains for the Continent (82378 A). Ills. & Plate. 500 w. Engr—Oct. 26, 1917. Detailed description.

An Ambulance Train for the United States Army (85745). Ills. 1200 w. Ry Age—April 19, 1918. Train built by L. & Y. Ry. Runs between the front and base hospitals in France.

Ash Pans

Locomotive Ash Pans (85425 A). Ills. 1800 w. Ry & Loc Eng—April, 1918. Development under the federal law; varieties in design.

Axles

Heat Treatment of Axles (87440 A). Dwight D. Miller. 2200 w. Ry Mech Engr—July, 1918. Scientific heat treatment of locomotive and car axles.

La Fabrication Des Essieux De Wagons Et De Locomotives (85108 C + D). L. Geuze. Ills. 3500 w. Revue De Métallurgie—Nov.-Dec., 1917. A study of the methods of manufacture of car and locomotive axles.

Back Pressure

La Coutre Vapeur (84589 C + D). A. Herdner. Ills. 110 pp. 32,000 w. Bul Soc Ingénieurs Civils De France—June-Sept., 1917. Comprehensive treatment of back pressure in locomotive cylinders, its use for braking, etc.

Boiler Repairs

Running Repairs of Locomotive Boilers, and Approved Methods of Wash-Out of Boilers (88121 A). Ills. 2500 w. Ry & Loc Eng—Aug., 1918. Successful maintenance of locomotive boilers in service.

Bolsters

Some Important Points in the Design of Box Bolsters (86839). Louis E. Endsley, with discussion. Ills. 25 pp. Pro St L Ry Cb—May 10, 1918. Analyzes stresses developed in different shaped box bolsters.

Brake Control

A Mechanical Brake Control System for Railways (88290 A). Ills. 2500 w. Engr—July 19, 1918. System known as the "Reliostop" is described—a British invention.

Cars

Steel Baggage Car for the United States Railroad Administration (88668). 1000 w. Ry Rev—Sept. 7, 1918. General description of design for all-steel 70-foot baggage car.

Cars

MOTIVE POWER AND EQUIPMENT

Cars

High Capacity Cars are a Narrow Gauge Railway in India (88103). Frederick C. Coleman. Ills. 1000 w. Ry Age—Aug. 9, 1918. Details of narrow-gage gondola and box cars for the Kalka Simla Ry.

Special Cars for Transporting Heavy Naval Guns (87936). Ills. 500 w. Ry Age—Aug. 2, 1918. Complete unit is 56 ft. long and will traverse curves with 100 ft. radius.

70-Ton Side Dump Hopper Cars Built by E. J. & E. (87221). Ills. 1000 w. Ry Age—June 28, 1918. Center sill is not continuous; the floor members are arranged to withstand buffing stresses.

Steel Frame Refrigerator Cars (87436 A). E. G. Goodwin. Ills. 2500 w. Ry Mech Engr—July, 1918. Norfolk and Western design has bunched insulation, insulated bulkheads and conduit floor racks.

Rehabilitation and Maintenance of the Wooden Freight Car (86917). P. P. Barthelemy. 3000 w. Ry Rev—June 8, 1918. Approved methods of putting wooden freight cars in condition to yield the maximum service.

Michigan Central Refrigerator Car (84863 A). Ills. 1000 w. Ry Mech Engr—March, 1918. Particular attention given to insulation.

Refrigerator Cars for the Michigan Central (84975). Ills. 1000 w. Ry Age—March 15, 1918. Design represents most modern practice.

High Capacity Narrow-Gauge Rolling Stock for Burma (83078 A). Ills. 700 w. Engr—Nov. 30, 1917. Dimensions and description.

Narrow Gauge Steel Hopper Car (83-043 A). Frederick C. Coleman. Ills. 700 w. Ry Mech Engr—Dec., 1917. For carrying mine products in Burma.

Refrigerator Cars for the B. & O. (83042 A). Ills. 1200 w. Ry Mech Engr—Dec., 1917. Details of interesting features.

Refrigerator Cars for the Baltimore and Ohio (82740). Ills. 1500 w. Ry Age Gaz—Nov. 30, 1917. Features of interest.

The Tank Car (83265). E. S. Way. Read before Car Foremen's Assn. of Chicago. 2500 w. Ry Rev—Dec. 29, 1917. Discusses rules of the construction and handling of cars carrying explosives.

Wood and Steel Car Construction (82765). H. S. Sackett. 4000 w. Ry Rev—Dec. 1, 1917. Urges increased use of timber in both freight and passenger car construction.

All Wood and Composite Hopper Cars for the Norfolk & Western Railway (83472 A). B. W. Kadel. Ills. 2500 w. Ry Rev—Jan. 5, 1918. Details of two recent designs.

Freight Car Orders in 1917 Reach Low Level (83468 A). Ills. 8 pp. Ry Age—Jan. 4, 1918. (Special No.) Domestic orders lowest since the year 1908.

The Business Box Car (83796 A). W. J. Bohan, with discussion. 10000 w. West Ry Cb, Pro—Dec. 17, 1917. Business of a box car and the relation of its construction.

Heavy Freight Cars for a Narrow Gauge Railway in India (89447 A). Ills. 1000 w. Ry Mech Engr—Oct., 1918. Details of all-steel high-capacity cars.

U. S. R. A. Standard Baggage Cars (89444 A). Ills. 1000 w. Ry Mech Engr—Oct., 1918. All steel construction.

Railroad Administrations Standard Baggage Cars (89167). Ills. 1200 w. Ry Age—Sept. 27, 1918. Designs for 60 ft. and 70 ft. cars of all-steel construction.

A 100-Ton Coal Car for the N. & W. (84183 A). B. W. Kadel. Ills. 1000 w. Ry Mech Engr—Feb., 1918. Details of construction.

C. M. & St. P. Fifty-Ton Gondolas (84185 A). Ills. 500 w. Ry Mech Engr—Feb., 1918. Steel center sill designed to resist buffing stresses only.

Hopper Bottom Gondola Cars for C. M. & St. P. (84028). Ills. 500 w. Ry Age Gaz—Feb. 1, 1918. Composite construction with heavy steel center sill.

Norfolk & Western Hopper Car of 100 Tons Capacity (84160). B. W. Kadel. Ills. 1000 w. Ry Age—Feb. 7, 1918. All-steel construction using six-wheel trucks. Load 77 per cent. of gross weight.

Hopper Cars Built by E. J. & E. (86174 A). Ills. 1200 w. Ry Mech Engr—May, 1918. Side dump type without continuous center sill, floor members designed to take buffing stresses.

Standard Steel Sheathed Box Car (86175 A). 500 w. Ry Mech Engr—May, 1918. Specifications and designs similar to other box cars, wood lining on sides and ends.

Norfolk & Western Composite and All-Wood Cars (85424 A). Ills. 1500 w. Ry & Loc Eng—April, 1918. Interesting features of gondola and box cars.

Can the Freight Car Situation Be Improved? (85454). 1500 w. Ry Age—April 5, 1918. Maintenance problem is serious.

MOTIVE POWER AND EQUIPMENT

Electrification

Clasp Brake

The Theory of the Clasp Brake (82-848 A). 1500 w. Ry & Loc Eng—Dec., 1917. What it is and what it does; its economies and advantages.

Counterbalance

Locomotive Counterbalance (82767). H. W. Snyder. 2000 w. Ry Rev—Dec. 1, 1917. Principles involved in the counterbalancing of two cylinder locomotives.

Design

The Universities and Equipment Development (83731 A). Ills. 3000 w. Ry Mech Engr—Jan., 1918. Value to the designer of scientific investigation.

Draft Gear

A Study of Friction Draft Gear Capacity (82475). Louis E. Endsley. Abstract of paper before Can. Ry. Club. Ills. 2500 w. Ry Age Gaz—Nov. 16, 1917. A travel of four inches or more is recommended.

Draw Gear

Friction Draw Gear (83546 A). Ills. 2500 w. Ry & Loc Eng—Jan., 1918. Capacity of draw gear; difference in give between wooden and steel cars. Tests.

Draft Gears

Draft Gears Should Be Maintained (89445 A). L. T. Canfield. 1500 w. Ry Mech Engr—Oct., 1918. Periodical inspection and repairs required for proper protection to the car and to the lading.

Proper Draft-Gear Maintenance (89208). L. T. Canfield. 1200 w. Ry Rev—Sept. 28, 1918. A report of five tests of gears; recommendations as to inspection and repair.

Dynamometer Tests

Dynamometer Tests and Their Relation to Locomotive Efficiency (87446 A). C. M. Darden. Ills. 2500 w. S & S W Ry Cb, Pro—May, 1918. Considers benefits gained by dynamometer test.

Dynamic Augment

Dynamic Augment—Need and Means of Reducing It (84887 A). E. W. Strong, with discussion. Ills. 45 pp. N Y Rd Cb, Pro—Feb. 15, 1918. Meaning of the term and the importance of the problem in the design of modern locomotives.

Electric Braking

Regenerative Electric Braking on the Locomotives of the C. M. & St. P. Ry. (86759 A). W. F. Coors. Ills. 4400 w. Gen Elec Rev—June, 1918. Explains principles, and action of trains using this feature under various conditions.

Regenerative Electric Braking on Locomotives of the C. M. & St. P. Ry.

(87011). W. F. Coors. Ills. 3000 w. Ry Rev—June 15, 1918. Explains the principle and advantages.

Electric Locomotives

Torque of Electric Motors as Applied to Electric Locomotives (88678 A). 1500 w. Ry & Loc Eng—Sept., 1918. Shows characteristic curves, telling how to read them and how to apply them to a locomotive.

New Single-Phase Locomotives for the Swiss Bundesbahn (88666). Hugo Studer. Ills. 1500 w. Elec Ry J1—Sept. 7, 1918. Details of four sample locomotives ordered.

Regenerative Electric Railways (88593 A). 2000 w. Elec Rev—Aug. 16, 1918. The economy of the regenerative system and its adoption on 3-phase, single-phase, and d. c. railways.

Torque of Electric Motors as Applied to Electric Locomotives (88125 A). 1800 w. Ry & Loc Eng—Aug., 1918. Serial, 1st part. Considers the individual torque characteristic of three different types of motor.

Locomotives A Courant Monophasé (87713 B). H. Studer. Ills. 3100 w. Génie Civil—June 15, 1918. New types of single-phase, A C locomotives built at Oerlikon Works for Swiss Railways.

Electrification

Electrification of the Central Argentine Railway (89515). Ills. 2500 w. Power—Oct. 15, 1918. Electrification to deal with suburban traffic near Buenos Aires.

Heavy Electric Traction on the Central Argentine (89345). Ills. 4000 w. Elec Ry J1—Oct. 5, 1918. An up-to-date electrified section serving suburbs of Buenos Aires.

Power Supply for the Central Argentine Electrification (89479). Ills. 2500 w. Elec Ry J1—Oct. 12, 1918. Supplies traction, lighting, and other requirements in the suburbs of Buenos Aires.

Norfolk & Western Electrification Helping Directly to Win the War (88349). Ills. 2500 w. Elec Ry J1—Aug. 24, 1918. Helped greatly in the transportation of coal; successful in technical and financial respects.

Electric Railways (88413). 1200 w. Times Engng Supp—July, 1918. Review of present tendency of development of both A C and D C systems.

Tendencies in Electrification (88031). E. A. Palmer. 3500 w. Ry Rev—Aug. 3, 1918. Read before Pacific Coast Ry Club. Résumé of leading projects in the United States. See also page 208.

Electrification of the New York Connecting Railroad and Hell Gate Bridge

Electrification MOTIVE POWER AND EQUIPMENT Electric Locomotives

(87428 A). Ills. 1000 w. Ry & Loc Eng—July, 1918. Detailed description of the single phase, overhead catenary system.

Electrification of the Chestnut Hill Suburban Branch of the Pennsylvania R. R. (86088). Map & Ills. 1500 w. Ry Rev—May 4, 1918. Details of construction and equipment from Philadelphia to Chestnut Hill.

Philadelphia—Chestnut Hill Electrification (86169). Ills. 2200 w. Ry Age—May 10, 1918. Latest improvements in catenary construction.

P. R. R. Extends Philadelphia Electrification to Chestnut Hill (85941). Ills. 2000 w. Elec Ry J1—Apr. 27, 1918. Construction shows that overhead for single-phase railway lines is approaching standardization.

See Iron Wire, under ELECTRICAL ENGINEERING, *Transmission and Distribution*.

Electrification of Railroads as a War Measure (83579 A). F. E. Wynne. Ills. 1800 w. Elec J1—Jan., 1918. What electrification is capable of doing.

Further Railroad Electrification Important (83520). F. H. Shepard. Ills. 2000 w. Elec Ry J1—Jan. 5, 1918. Aims to show that electrical equipment gives an effective way of increasing transportation capacity.

Electrification of New York Connecting Railroad (86737). Ills. 1800 w. Ry Age—June 7, 1918. Method of operation on this link between the Pennsylvania and New Haven systems.

Extension of Railway Electrification (86916). L. F. Wilson. Ills. 2500 w. Ry Rev—June 8, 1918. Discussion of electrification problems and economics, and sources of power other than water-power.

The Reasons for Steam Railroad Electrification (86849). Q. W. Hershey. Ills. 1200 w. Ry Age—June 14, 1918. Density of traffic and safety.

Features in the Electrification of the Chicago, Milwaukee and St. Paul Railway, U. S. A., Including a 440 Mile Journey Through the Rocky Mountains (83215 N). J. W. Kirkland. 1500 w. So Af Inst Elec Engrs, Trans—Sept., 1917. Remarks in connection with the showing of views.

Savona-Ceva (Italy) Mountain Railway Electrification (83277). W. Lesniewski. Ills. 1800 w. Elec Ry J1—Dec. 29, 1917. Difficulties overcome by three-phase locomotives, including use of pushers. The line averages one tunnel per mile.

La Trazione Elettrica Sulla Linea Del Gottardo (83302 B). 2400 w. Monitore Tecnico—Oct. 30, 1917. Traffic and locomotive performance on the St. Gotthard line.

Opening Address by President E. W. Rice, Jr., at A. I. E. E. Midwinter Convention, February 15, 1918 (84768 D). 2500 w. A I E E, Pro—March, 1918. On railway electrification as a means of saving fuel and relieving freight congestion.

Einige technische Notizen über die elektrische Langenthal-Melchnau Bahn (85101 B). F. Marti-Ziegler. Ills. 3100 w. Bul Schweiz Elektrotechnischer Verein—Jan., 1918. Electrical details of mountain railway between Langenthal and Melchnau. Equipment, signaling, etc.

Electricity

Report of Committee XVIII—On Electricity (85024 C). Ills. 37 pp. Am Ry Eng Assn, Bul—Feb., 1918. Data on overhead clearance, electrolysis and insulation, etc.

Electric Locomotives

Baldwin-Westinghouse Passenger Locomotive for the C. M. & St. P. R. R. (85607 A). F. H. Shepard. Ills. 12 pp. N Y Rd Cb, Pro—March 15, 1918. Design and construction of this new 240 ton D. C. 2400-volts locomotive.

Schwere Güterzulokomotive der Bernina Bahn (85861 B). 900 w. Schweiz Bauzeitung—Feb. 23, 1918. New electric locomotives for Bernina Railway, Switzerland, for work on steep grades and through heavy snow.

New 180-Ton Locomotives for the New York, New Haven & Hartford Railroad (85606 A). E. R. Hill. Map & Ills. 1500 w. N Y Rd Cb, Pro—March 15, 1918. Describes new electric locomotives designed to haul heavy passenger trains over the steep grade of the Hell Gate bridge.

Most Powerful Electric Passenger Locomotives (84032). Ills. 1200 w. Ry Age—Feb. 1, 1918. New power for Chicago, Milwaukee & St. Paul.

New Passenger Locomotive for the St. Paul (84054). Ills. 1000 w. Elec Ry J1—Feb. 2, 1918. Mechanical features; motors, control, and auxiliaries.

Pennsylvania Electric Locomotive (84182 A). Ills. 2500 w. Ry Mech Engr—Feb., 1918. Details of running gear and electrical equipment.

The New Passenger Locomotives of the Chicago, Milwaukee, and St. Paul Railway (84126 A). W. R. Stinemetz. Ills. 1000 w. Elec J1—Feb., 1918. Interesting features of the most powerful locomotives in passenger service.

Electric Vehicles MOTIVE POWER AND EQUIPMENT Fuel Conservation

Developments in Electric Locomotives in Italy (83380 A). Ills. 1200 w. Engng—Dec. 14, 1917. Serial. 1st part. Deals with improvements on the electric locomotives of the Italian State Railways.

Mechanical Problems in the Design of Electric Locomotives (83581 A). W. K. McAfee. Ills. 2000 w. Elec J—Jan., 1918. Problems relating to tracking qualities, transmission of power from the motors to the rails, and design of motors.

Four Improved Types of Electric Locomotives (85153). Maps & Ills. 3000 w. Ry Age—March 22, 1918. Recent developments to meet demands of traffic and profile.

New Haven Orders Five 180-Ton Electric Locomotives (85094). Ills. 700 w. Eng News-Rec—March 21, 1918. Needed to haul trains over New York connecting railroad, where grades are too heavy for present power.

Electric Vehicles

Midland Railway Electrics (84644 A). Ills. 1800 w. Elec Rev—Feb. 8, 1918. Deals with vehicles put into service by this railway. Based on article in the *Commercial Motor*.

Engine Failures

Engine Failures—Their Chief Causes and Prevention (85426 A). 1300 w. Ry & Loc Eng—April, 1918.

Equipment

Government Car and Locomotive Orders (86167). 2500 w. Ry Age—May 10, 1918. Distribution of orders with discussion of prices, specialties, and policies.

Car Construction and Maintenance of Passenger and Freight Equipment (86251 A). D. D. Wilson, with discussion. Ills. 12 pp. S & S W Ry Cb, Pro—Jan., 1918.

New Consolidation Locomotives and Excursion Cars on the Victorian Railways (87941 A). Ills. 1000 w. Engr—July 5, 1918. Detailed description.

Physical Needs of the Railways Under Government Control (85641 D). Julius H. Parmelee. 16 pp. An Am Acad—March, 1918. Reviews recent traffic history and attempts a forecast of future traffic developments and needs.

Exhaust Nozzles

Locomotive Exhaust Nozzles (88124 A). Ills. 2000 w. Ry & Loc Eng—Aug., 1918. Construction of nozzles, and their working.

Feed-Water Heaters

The History of Locomotive Feed Water Heaters (88674 A). J. Snowden Bell. Ills. 4400 w. Ry & Loc Eng—Sept., 1918. Salient features of an exhaustive paper.

Feed Water

Feed Water Heaters (87376). J. Snowden Bell. Ills. 2000 w. Ry Rev—July 6, 1918. Basic principles on which feed water heaters for locomotive use should be constructed.

Fire-boxes

Renewable Stay Heads for Locomotive Fireboxes (89044 A). Ills. 2500 w. Engr—Aug. 30, 1918. A patent device for renewing small or defective stay heads and its advantages.

Firebox Design

Radiant Heat and Firebox Design (86818 A). Résumé of paper by J. T. Anthony, before the Cent. Ry. Cb. Ills. 2500 w. Ry Loc Eng—June, 1918. Illustrates the process of radiation, showing the bearing on design.

"Radiant Heat and Fire Box Design (86932 A). James T. Anthony. Ills. 28 pp. Cent Ry Cb, Pro—May 10, 1918. Some of the important points in design of fireboxes.

Freight Cars

—The Freight Car—A Factor in Winning the War (82394 N). E. H. De Groot, Jr., with discussion. 38 pp. N E Rd Cb—Oct. 9, 1917.

French Equipment

Difficulties in Handling French Equipment (89633). J. N. McVey. 4000 w. Ry Rev—Oct. 19, 1918. Account of trials encountered by American railway engineers.

Fuel Association

The Fuel Association Convention (86971 A). 6000 w. Ry Mech Engr—June, 1918. Abstracts of papers on fuel economy.

Fuel

Successful Introduction of Pulverized Fuel on the Central Railway of Brazil (82844 A). Ills. 2000 w. Ry & Loc Eng—Dec., 1917. Account of the successful use of slack coal and its importance in Brazil.

Pulverized Fuel for Locomotives (84522 N). J. S. Coffin, Jr. Ills. 4500 w. Can Min Inst, Trans—1917. History, equipment, operation, tests and conclusions. See pp. 280, 302.

Who Wastes the Fuel? (84158) 2000 w. Ry Age—Feb. 8, 1918. Showing that responsibility and shortcomings extend from the president to the water boy.

Fuel Conservation

The Railroad Fuel Conservation Campaign (88999). Eugene McAuliffe. 2000 w. Ry Rev—Sept. 21, 1918. True statement of the situation, and the extreme need for improvement. How railways may improve conditions.

MOTIVE POWER AND EQUIPMENT

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Fuel Economy

How Can Coal be Saved on the Engine (87631). 1500 w. Ry Age—July 19, 1918. Suggestion to aid in fuel economy.

Fuels

Anthracite Silt as a Locomotive Fuel (87009). Ills. 2000 w. Ry Rev—June 15, 1918. Experiments made with a mixture of anthracite silt, describing methods of its preparation.

Fuel Saving

Fuel Conservation on the Santa Fé (87-845). Charles E. Parks. 3000 w. Ry Rev—July 27, 1918. Explains methods.

Gasoline Locomotives

U. S. A. Gasoline Locomotives (85486). Ills. 1500 w. Auto Ind—April 4, 1918. Built in three sizes for use on tracks behind the battle lines.

Guides

Adjusting the Guides and Crossheads (83548 A). Ills. 1800 w. Ry & Loc Eng—Jan., 1918. Directions for proper adjustment.

Headlights

Locomotive Headlights (83547 A). 2000 w. Ry & Loc Eng—Jan., 1918. Peculiarities of the parabolic curve; the electric headlight; how case and reflector serve their purpose.

Inspection

Federal Locomotive Inspection (83-041 A). Ills. 1500 w. Ry Mech Engr—Dec., 1917. Abstract of Sixth Annual Report of the chief inspector of locomotive boilers to the I. C. C.

Federal Locomotive Inspector's Report (83025). Ills. 1500 w. Ry Age Gaz—Dec. 14, 1917. Increase in supervision and inspection necessary.

Journal Box Packing

The Journal Box Packing Situation (89446 A). 2000 w. Ry Mech Engr—Oct., 1918. Materials used and possible means of overcoming shortage.

Light Railways

Chemins De Fer A Voie Etroite (86471 B). G. Mangin. Ills. 2300 w. Génie Civil—Apr. 6, 1918. Locomotives and cars used on German and Austrian narrow gauge railways in the fighting zone.

Locomotives

The U. S. Standard Heavy Mikado Type Locomotive (88516). Ills. 1200 w. Ry Age—Aug. 30, 1918. Recently completed by Am. Locomotive Co. Second of standard types to be placed in service.

The First Standard 0-8-0 Type Switching Locomotive (88941). 600 w. Ry Age—Sept. 20, 1918. Total weight 214,000 lb.; tractive effort 55,000 lb.

4 Cilinder Compound-locomotieven voor Java (89055 B). I. Franco. Ills. 5900 w. Ingenieur—July 20, 1918. 4 Cylinder compound, 4-6-2 type, with feed-water heater built for Dutch railways in Java.

Locomotive Boilers

Increase Life and Service of Locomotive Boilers (84653). George Austin. Ills. 2500 w. Ry Age—March 1, 1918. Treating feed water to prevent scale and corrosion.

Locomotive Crane

Grue-Locomotive De 35 Tonnes (89703 B). Ills. 1000 w. Génie Civil—Sept. 14, 1918. 35-ton locomotive crane for use behind the lines in France.

Locomotive Design

Modern Tendencies in Locomotive Design (84051). Louis E. Endsley. 1500 w. Ry Rev—Feb. 2, 1918. Leading factors and developments.

Locomotive Handling

Terminal Handling of Locomotives (85789 A). Frank C. Pickard, with discussion. Ills. 32 pp. Cent Ry Cb, Pro—March, 1918. Suggestions for maintaining their efficiency.

Locomotive Development

The Advance of Science Applied to Locomotives in the Last Eighteen Years (88676 A). 1700 w. Ry & Loc Eng—Sept., 1918. Review of progress.

Locomotive Maintenance

European and American Practice (87431 A). 1200 w. Ry & Loc Eng—July, 1918. Explains systems of design and maintenance.

Locomotive Performance

The Graphical Representation of Locomotive Performance (86247 A). H. Holcroft. 3000 w. Engr—Apr. 26, 1918. Serial, 1st part. Gives a method of plotting the speed curve with rapidity over any section of road for a given locomotive and train.

Increase Locomotive Operating Efficiency (83727 A). Clement F. Street. Ills. 3000 w. Improvements being made with a view to increasing earnings.

Performance of the Mohawk or 4-8-2 Locomotive of the New York Central Railroad (83550 A). Ills. 500 w. Ry & Loc Eng—Jan., 1918. Good tractive effort at high speed.

Locomotives

First Standard 0-8-0 Switcher (89442 A). Ills. 1200 w. Ry Mech Engr—Oct., 1918. Total weight 214,000 lbs.; tractive effort 55,000 lbs.

Heavy Mallet Compound for Virginian Railway (89300). Ills. 1500 w. Ry Rev—Oct. 5, 1918. Describes the

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MOTIVE POWER AND EQUIPMENT

Locomotives

fifth of a series of designs of heavy Mallet type locomotives.

Heavy Mallet Locomotives for the Virginian (89598). Ills. 1000 w. Ry Age—Oct. 18, 1918. Built for operation on heavy grades.

Some Recent American Freight Locomotives (89343 A). Ills. 2000 w. Engr—Sept. 13, 1918. Three locomotives of different types recently built by Baldwin Locomotive Works for freight service.

U. S. R. A. Standard Six-Wheel Switching Locomotive (89424). Ills. 1000 w. Ry Age—Oct. 11, 1918. The first of the smallest government engines to be built.

A Three-Cylinder Locomotive (88397 A). Ills. and plate. 500 w. Engr—July 26, 1918. Details of the 3-cylinder coal engine of the Great Northern Ry.

Goods Locomotive for the Victorian Railways (87897 A). Ills. 500 w. Engr—July 5, 1918. Consolidation type for heavy goods traffic.

Pacific and Mikado Type Locomotives for C. B. & Q. (87938). Ills. 1200 w. Ry Age—Aug. 2, 1918. Based on previous designs, with improved details.

Railroad Administration's Motive Power Problem (85574). Alba B. Johnson. Read at Chicago meeting of U. S. Chamber of Commerce. 3300 w. Ry Age—April 12, 1918. The development of the American locomotive and the possible effects of standardization.

Standardization of Locomotives; Great Central Railway (85684 A). Ills. & Plate. 2000 w. Ry Engr—March, 1918. 2-8-0 mineral engines: selection of the design by the ministry of munitions.

Why Locomotives Should Not Be Standardized (85441). 3000 w. Ry Age—April 5, 1918. Reasons against standardization of locomotives for United States railways.

A Yankee's Idea of French Engines (86172 A). Ills. 1700 w. Ry Mech Engr—May, 1918. Describes the motive power and troubles in maintaining it.

Santa Fe Locomotive for the Belt Railway of Chicago (85965). Ills. 800 w. Ry Rev—Apr. 27, 1918. Heavy locomotive for hump yard work, although adaptable to transfer and road work.

Specifications of the United States Government Standard for Locomotives (86100 A). Also editorial. Ills. 4000 w. Ry & Loc Eng—May, 1918. Proposed standards.

Nuovi Locomotori Elettrici (86476 B). Ills. 1200 w. L'Industria—Mar. 15, 1918. Narrow gauge Alpine railway 38 miles

long, and rising 5,900 ft. in 24 miles. Locomotive with four motors geared to countershafts and connecting rods for propulsion system.

Status of Standard Locomotives (86173 A). Ills. 1500 w. Ry Mech Engr—May, 1918. Probable extent to which they will be used; tentative general dimensions of proposed types.

Vierkuppel Rangierlokomotive der Schweiz-Bundesbahnen (86466 B). M. Weiss. Ills. 2000 w. Schweizerische Bauzeitung—Apr. 20, 1918. Switch engine, 0-8-0 type for Swiss federated railways.

Features and Functions of Goods Locomotives (87493 N). William Prior Hales. Ills. 2000 w. Comwh Engr—June, 1918. Types in use on railways of several states of Australia.

First of U. S. Standard Locomotives Completed (87630). Ills. 1000 w. Ry Age—July 19, 1918. Light Mikado type for service on the B. & O.

Mallet Articulated Locomotives for the Baltimore & Ohio Railroad (87430). Ills. 1200 w. Ry & Loc Eng—July, 1918. Detailed description.

Mikado Type of Locomotive for the United States Government (87692). Ills. 700 w. Ry Rev—July 20, 1918. Represents best conservative thought in American locomotive design.

Norfolk & Western 267-Ton Mallet Locomotive (87506). H. W. Reynolds. Ills. 2000 w. Ry Age—July 12, 1918. Details of design.

Conversion of Single-Expansion to Compound Engines on French Railways (83385 A). Ills. & Plate. 1000 w. Engr—Dec. 14, 1917. Arrangements adopted.

1917 a Record Breaker in Locomotive Orders (83467 A). 6 pp. Ry Age—Jan. 4, 1918. (Special No.) Orders totaling 7,642 as compared with 5,893 in 1916. Bright prospects for coming year.

Conversion of Freight to Switch Locomotives (82209). W. H. Hauser. Ills. 800 w. Ry Age Gaz—Nov. 2, 1917. Obsolete engines rebuilt for modern service.

Locomotive Design and Construction from a Maintenance Standpoint (82514). W. H. Winterrowd. Read before Can. Ry. Club. 2500 w. Can Engr—Nov. 15, 1917. Importance of design in relation to maintenance.

Pennsylvania Electric Freight Locomotive (82598). Ills. 2500 w. Ry Age Gaz—Nov. 23, 1917. Notable features of the running gear construction and the electrical equipment.

Electric Locomotives MOTIVE POWER AND EQUIPMENT M. C. B. Assn.

Large Type of Locomotives for the Wabash Railway (82846 A). Ills. 900 w. Ry & Loc Eng—Dec., 1917. Increase in weight and tractive power.

Locomotives of the 2-10-2 Type for the Wabash (82868). Ills. 1000 w. Ry Age Gaz—Dec. 7, 1917. Large boilers make possible high sustained capacity.

New York Central 4-8-2 Type Locomotives (83244). Ills. 1500 w. Ry Age Gaz—Dec. 28, 1917. Type for freight service on low-grade line.

Santa Fé Type Locomotives for the Wabash Railway (82766). Ills. 600 w. Ry Rev—Dec. 1, 1917. Modern design of freight locomotive for heavy road service.

The "Ruston" Oil Locomotive (83,069 A). 1200 w. Engng—Nov. 30, 1917. Describes this industrial locomotive and its design.

Electric Locomotives

Ten Powerful Baldwin Westinghouse Electric Passenger Locomotives for the Chicago, Milwaukee & St. Paul Railway (85427 A). Ills. 1700 w. Ry & Loc Eng—April, 1918. Twin motor design with quill drive.

The 3000 Volt D. C. Gearless Locomotive for the C., M., & St. P. R. R. (85608 A). A. H. Armstrong. Ills. 7 pp. N Y Rd Ch, Pro—March 15, 1918. Details of locomotive having bi-polar motors.

Locomotives

Drafting Modern Locomotives (86967 A). H. W. Coddington. 1500 w. Ry Mech Engr—June, 1918. Serial, 1st part. Improvements effected by a study of draft conditions on Norfolk & Western 4-8-2 type engines.

Nuovi Locomotori Trifosi A Quattro Velocità Delle Ferrovie Dello Stato (87106 B). E. Bovone. Ills. 2600 w. Industria—Apr. 15, 1918. Electric locomotive for Italian railways with three-phase, A. C. motors, four speeds and connecting rod-countershaft drive.

Pacific Type 4-6-2, Built by the Philadelphia & Reading Railway (86822 A). Ills. 1200 w. Ry & Loc Eng—June, 1918. Engines built to handle heavy and fast passenger service.

Recent Advantages in Locomotive Efficiency, Paris, Lyons, & Mediterranean Ry. (87008). Charles R. King. Ills. 1800 w. Ry Rev—June 15, 1918. Uses compound principle in conjunction with superheating.

Small Locomotives of Special Types (86721 A). Ills. 2000 w. Engr—May 17, 1918. Serial, 1st part. Types built in England.

Pacific and Mikado Type Locomotives, C. B. & Q. R. R. (87375). Ills. 1200 w. Ry Rev—July 6, 1918. Four designs, constructed with a large number of interchangeable parts.

Tests with 2-10-2 Locomotive on the Union Pacific (87224). Ills. 1000 w. Ry Age—June 28, 1918. In service six months with very satisfactory results. Heavy freight locomotive.

Standardization of Indian Railways' Locomotives (86848). E. C. Poultney. Ills. 2500 w. Ry Age—June 14, 1918. Developed by British Engineering Standards Committee for the Secretary of State for India.

Ten-Wheel Locomotives for the Central Railroad of New Jersey (86819 A). Ills. 900 w. Ry & Loc Eng—June, 1918. 4-6-0 type for fast freight service.

2-10-2 Type Locomotives for the U. P. (86965 A). Ills. 1200 w. Ry Mech Engr—June, 1918. Built for service on heavy grade division.

Consolidation Type Locomotives for French Railways (84787). Ills. 700 w. Ry Age—March 8, 1918. Recently completed French locomotives, built in America.

Intensive Locomotive Development (84860 A). O. S. Beyer, Jr. Ills. 2000 w. Ry Mech Engr—March, 1918. Serial, 1st part. Possibilities of greater economy of operation.

Locomotives for the French State Railways (84726 A). Ills. 1200 w. Ry & Loc Eng—March, 1918. Engines recently completed by the American Locomotive Co.

Lubrication

Difficulties of Locomotive Lubrication (87336 A). 1800 w. Mech Wld—May 31, 1918. The problem of valve and cylinder lubrication is discussed.

Difficulties of Locomotive Lubrication (85353). 2500 w. Ry Rev—March 30, 1918. Exposition of existing conditions. A committee report of Trav. Engrs. Assn.

Materials

Railway Materials and the War (84265 A). R. J. Pike. 2500 w. A E R A—Jan., 1918. Economy the only solution of the problem.

M. C. B. Rules

Annual Report of the Standing Committee on Revision of M. C. B. Rules of Interchange (86252 A). 28 pp. Ry Ch Pitts, Pro—Mar. 22, 1918. Recommended changes with discussion.

M. C. B. Assn.

A Statement of the Purpose of the M. C. B. Association (87435 A). Joseph W. Taylor. 2000 w. Ry Mech Engr—

Mechanical Assns.**MOTIVE POWER AND EQUIPMENT****Tires**

July, 1918. Reasons and objects for its formation, and information relating to developments.

Mechanical Associations

The Past and Future of the Mechanical Associations (87168). William Schläfge. 2000 w. Ry Rev—June 22, 1918. Address to the annual convention of the Am. Ry. Master Mechanics' Assn. Favors nationalization of railways.

Military Lines

Chemins De Fer A Voie Étroite (87714 B). E. Lemaire. Ills. 7700 w. Génie Civil—June 22, 1918. Locomotives and cars for military lines of 23.6 in. gage behind the Allies fighting front. Track material, gun trucks, etc.

Motive Power

Winter Temperatures and Locomotive Capacity (84968). W. L. Bean. 1400 w. Ry Age—March 15, 1918. Study of the relation between decreasing temperature and increasing motive power requirements.

Packings

Development and Manufacture of Journal Box Packings (82843 A). Ills. 1600 w. Ry & Loc Eng—Dec., 1917. Machines and methods used.

Pulverized Coal

Pulverized Coal on American Locomotives (88855 A). Ills. 2000 w. Engr—Aug. 23, 1918. Serial, 1st part. Reviews the history of its use in the U. S.

See also pp. 280, 302, 359.

Rail Return

Le Conducteur De Retour Du Courant Alternatif (84597 B). 4000 w. Le Génie Civil—Dec. 29, 1917. Rail return for A. C. railways. Feeders, bonding, etc. Experiences on French railways.

Le Conducteur De Retour (86496 E). J. Lhériand. Ills. 20,000 w. Mem Soc Ingénieurs Civils De France—Oct.-Dec., 1917. Rail return for traction current on single-phase A. C. line, Midi Railway, France.

Ry. Fuel Assn.

Annual Convention of Railway Fuel Association (86525). 6500 w. Ry Age—May 24, 1918. Presidential address and papers by W. S. Carter, Frank McManamy, Robert Quayle, and E. H. DeGroot, Jr.

Refrigerator Cars

The Ability of Refrigerator Cars to Carry Perishable Products (82395). M. E. Pennington, with discussion. Ills. 30 pp. St L Ry Cb, Pro—Oct. 12, 1917. The saving of foodstuffs, their transportation, and related topics.

Regenerative Braking

Note Sur Le Démarrage Automatique Des Moteurs (84602 B). P. Legrand. Ills. 3500 w. L'Industrie Électrique—

Jan. 25, 1918. Automatic braking for A. C. and D. C. motors. French schemes of wiring and motor control.

Smoke Prevention

Locomotive Stokers and Smoke Prevention (88643). W. S. Bartholomew. Abstract of paper before Smoke Prevention Assn. 2500 w. Ry Age—Sept. 6, 1918. With careful firing lighter fires can be carried with more perfect combustion.

Superheater Dampers

Installation and Maintenance of Superheater Dampers (87012). Ills. 1600 w. Ry Rev—June 15, 1918. Instructions for installing, adjusting and keeping in serviceable condition.

Signals

How Signals Can Increase Track Capacity (86740). C. C. Anthony. Ills. 3500 w. Ry Age—June 7, 1918. Explains means of increasing traffic on multiple tracks.

Why Signals Are Essential for Heavy Traffic (86940). C. C. Anthony. 3500 w. Ry Sig Engr—June, 1918. Analysis of results to be obtained by the proper application to lines.

Superheaters

Installation and Repair of Superheater Dampers (87429 A). Ills. 1000 w. Ry & Loc Eng—July, 1918. Explains methods of maintaining proper adjustment of the parts.

Supplies

Ordering, Distribution and Use of Supplies (83010 N). George C. Yeomans, with discussion. 32 pp. NE Rd Cb—Nov. 13, 1917. Principles necessary to secure best results.

Steel Cars

Development of the Steel Car (84-651). Henry P. Hoffstot, before Traffic Club of Pittsburgh. 1500 w. Ry Age—March 1, 1918. Reviews the history of the development.

Tank Cars

The Tank Car in Interchange (84184 A). E. S. Way. Ills. 1500 w. Ry Mech Engr—Feb., 1918. Characteristics of the different types under M. C. B. specifications.

Tenders

An Innovation in Tender Design (83-041 A). Ills. 800 w. Ry Mech Engr—Dec., 1917. Construction used on Rock Island lines.

Tires

La Fabrication Des Bandages De Roues De Wagons Et De Locomotives (85109 C + D). L. Geuze. Ills. 5700 w. Revue De Métallurgie—Nov.-Dec., 1917. Methods of manufacture of tires for locomotives and cars.

PERMANENT WAY AND BUILDINGS

Crossings

Tonnage Rating

Tonnage Rating of the Standard Locomotives (89261). H. S. Vincent. 800 w. Ry Age—Oct. 4, 1918. Charts from which the maximum hauling capacity in tons of 2,000 lbs. can be read directly for any combination of speed and grade within given limits.

Trains

Special Train for the Director-General of Transportation (83767 A). Ills. & Plate. 1000 w. Engr—Jan. 4, 1918. Built by the North-Eastern Ry. Co. of England for the British Director-General and his staff.

Truck Bolsters

Freight Car and Tender Truck Bolsters (85665 A). G. S. Chiles and R. G. Kelley. Ills. 3300 w. Ry Mech Engr—April, 1918. Serial, 1st part. General principles involved in the design, loading and testing of truck bolsters.

U. S. Standard Cars

United States Standard Freight Car Equipment (85494). Ills. 900 w. Ry Rev—April 6, 1918. General construction of the 55 and 70-ton hopper cars with details of some of the castings and other parts of eight designs.

The United States Standard Cars (85664 A). Ills. 20 pp. Ry Mech Engrs—April, 1918. Specifications and principal drawings of the new freight cars to be purchased by the government.

United States Standard Steel Sheathed Box Cars (85576). Ills. 500 w. Ry Age—April 12, 1918. Details of construction and design.

Designs of United States Standard Cars (85447). Ills. 2000 w. Ry Age—April 5, 1918. Noteworthy features.

Specifications for the United States Standard Cars (85331). 3000 w. Ry Age—March 29, 1918. Seven types of bodies for box, hopper and gondola cars, and three types of trucks.

United States Railroad Administration's Freight Car Equipment Standards (85352). Ills. 3500 w. Ry Rev—March 30, 1918. Résumé of the freight car equipment specifications.

U. S. Standard Engines

Tentative Specifications for Standard Locomotives (85747). 1200 w. Ry Age—April 19, 1918. General dimensions of the twelve locomotives proposed.

Latest Developments in Locomotive Standardization (85894). 1500 w. Ry Age—April 26, 1918. Roads permitted to ask for special designs for conditions not met by standard types.

Modern Versus Standardized Railway Equipment (85892). J. E. Muhlfield. 2500 w. Ry Age—April 26, 1918. Discusses the adoption of standard types of locomotives.

Valve Setting

Practical Hints on Valve Setting (88675 A). Ills. 1800 w. Ry & Loc Eng—Sept., 1918. Correction of errors.

Wheel Centers

La Fabrication Des Centres De Roues De Wagons (85110 C+D). L. Geuze. Ills. 4300 w. Revue De Métallurgie—Nov.-Dec., 1917. Manufacture of car wheel centers by the five-roll method.

Wheel Contacts

Wheel Contacts on Railheads (84335 B). George H. Barbour, with discussion. Ills. 34 pp. Engrs Soc W Penn, Pro—Nov., 1917. Revision of calculations given in April meeting, and published in July, 1917, Proceedings.

PERMANENT WAY AND BUILDINGS

B. & O. Grades

Baltimore & Ohio Grade Separation at Pittsburgh (85744). Ills. 2500 w. Ry Age—April 19, 1918. Main tracks raised on an earth fill and steel viaduct for more than a mile.

Ballast

Report of Committee II—On Ballast (85027 C). 44 pp. Am Ry Eng Assn, Bul—Feb., 1918. Depth of ballast of various kinds, etc.

British Railways

The Modern British Railway: Its Inception, Construction and Maintenance (84560 N). T. H. Seaton. 13 pp. Per-Way Instn, JI—Dec., 1917. Economic considerations.

Clay Formation

Methods of Dealing with Railway Formation in Clay Cutting (84561 N). J. H. Chappell. Ills. 1500 w. Per-Way Instn, JI—Dec., 1917. Methods described.

Combined System

Das neue vereinigte Reibungs- und Zahnbahn-System Peter (84601 B). S. Abt. Ills. 1800 w. Schweizerische Bauzeitung—Jan. 5, 1918. Serial, 1st part. Combined adhesion and rack rail electric railway—Peter System.

Crossings

Report of Committee IX—On Signs, Fences, and Crossings (85026 C). Ills. 64 pp. Am Ry Eng Assn, Bul—Feb., 1918. Principles, legal requirements, over and undergrade crossings, etc.

PERMANENT WAY AND BUILDINGS

Narrow Gage

Curved Resistance

The Mechanics of Curved Resistance (89556). From a paper by J. G. Sullivan. Ills. 5000 w. Ry Rev—Oct. 12, 1918. A study covering older theories with data of recent experiments.

Essential Work

Essential Work (89600). C. A. Morse. 1500 w. Ry Age—Oct. 18, 1918. Suggestions for taking care of railway business under present conditions of shortage of labor and materials.

Freight House

Pennsylvania Completes Freight House at Chicago (87937). Ills. 2500 w. Ry Age—Aug. 2, 1918. Two-level type of structure.

New Freight House of the Pennsylvania Lines in Chicago (84977). Ills. 1500 w. Ry Rev—March 16, 1918. Details of one of the largest and best equipped stations in the United States.

Freight Station

New Freight Station of the New York Central Lines in Cleveland (86351). Ills. 2500 w. Ry Rev—May 18, 1918. Designed to permit freight handling by mechanical tractors.

Freight Station and Warehouse Has 23 Acres of Floor (84616). Ills. 1800 w. Eng News-Rec—Feb. 28, 1918. Six-story structure of standardized design houses L. C. L. clearing house.

New Federal Street Freight Station of the Pennsylvania Railroad at Philadelphia (83005). Ills. 1500 w. Ry Rev—Dec. 15, 1917. Detailed description.

Freight Terminal

New Ocean Freight-Terminal Started on Staten Island (83675). Ills. 1800 w. Eng News-Rec—Jan. 17, 1918.

Grades

Oregon-Washington Railway Separates Grades for Three Miles at Portland (86696). Ills. 2000 w. Eng News-Rec—June 6, 1918. Track depression is combined with elevation of street approaches.

Holland

De nieuwe stapelplaats der Staatspoorwegen aan de Zeehaven te Dordrecht (87110 B). F. Van V. De Coningh. Ills. 6200 w. Ingenieur—Apr. 6, 1918. Woodworking shops and timber treating plants of Dutch State Railways at Dordrecht.

Improvements

Distribution of Additions and Betterments (86625). 3000 w. Ry Age—May 31, 1918. Analysis of expenditures to be made on improvements for forty-nine lines.

Labor Shortage

The Labor Shortage in the Maintenance Department (85446). 2000 w. Ry Age—April 5, 1918. Possible sources of supply and means of reducing demand.

Light Railroads

Light Railroads at the Front (87693). 1500 w. Ry Rev—July 20, 1918. Brief account of the light railroads operating in France and their usefulness.

Light Railways

Large Mileage of Light Railways Will Serve American Troops at the Front (84923). Robert K. Tomlin, Jr. Ills. 2200 w. Eng News-Rec—March 14, 1918. Organization for big construction programme.

Locomotives

N. Y. C. 4-8-2 Type Freight Locomotives (84179 A). Ills. 1500 w. Ry Mech Engr—Feb., 1918. Details and dimensions.

Santa Fe 2-8-2 Type Locomotive (84181 A). Ills. 1000 w. Ry Mech Engr—Feb., 1918. Increased power capacity as compared with an earlier class of same type.

Some British Locomotives of 1917 (84026 A). Ills. 2500 w. Engr—Jan. 11, 1918. New engines and modifications of existing engines.

Locomotive Works

At the Works of the Nathan Manufacturing Company, Flushing, Long Island, New York (86101 A). Ills. 1800 w. Ry & Loc Eng—May, 1918. Plan and description.

Maintenance

Maintenance Work Is Being Seriously Delayed (87507). 3500 w. Ry Age—July 12, 1918. Shortages of labor, rail, and ties.

Review of Prospects for Railway Maintenance and Improvement Work in 1918 (86044). 2500 w. Eng News-Rec—May 2, 1918. Government restrictions may be relieved, but labor shortage is serious.

Large Expenditures Needed for Maintenance of Way (85453). 1200 w. Ry Age—April 5, 1918. Deficiency in upkeep.

Masonry

Report of Committee VIII—On Masonry (85028 C). Ills. 44 pp. Am Ry Eng Assn, Bul—Feb., 1918. Report and appendices.

Narrow-Gage

Along the British Front by Light Railway (86872). Robert K. Tomlin, Jr. Ills. 2500 w. Eng News-Rec—June 13, 1918. Serial, 1st part. Impressions of a week's study of the narrow-gage system.

PERMANENT WAY AND BUILDINGS

Repair Shops

Passenger Stations

Safety Conditions in and About Passenger Stations (86354). 4000 w. Ry Rev—May 18, 1918. Serial, 1st part. From report of the Committee on Buildings of the Am. Ry. Eng. Assn.

Rail Fissures

Transverse Rail Fissures and the Derailment at Juniper, Ga. (88530). Ills. Also editorial. 3200 w. Ry Rev—Aug. 31, 1918. From report of James E. Howard on investigations made.

Rail Heads

Inhibited or Delayed Transformations in Rail Heads (85022 C). Dr. P. H. Dudley. 2000 w. Am Ry Eng Assn, Bul—Jan., 1918. Associated with two or more conditions of the steel, indicated by cores or zones. Appendix G.

Railroad Shop

Historic Railroad Shop in Nevada (82565). Frank A. Stanley. Ills. 1500 w. Am Mach—Nov. 22, 1917. Shop established at Carson City, in 1870.

Influence of Gauge Length on Elongation in Drop Test of Rails (82169 N). M. H. Wickhorst. 800 w. Am Ry Eng Assn, Bul—Sept., 1917. Study, with drop test results.

Tests of Manganese Steel Rails (82170 N). M. H. Wickhorst. 20 pp. Am Ry Eng Assn, Bul—Sept., 1917. Reports of tests by a number of railroads.

Rails

Transverse Fissures in Steel Rails (85792 D). Ills. 12000 w. A I M E, Bul—April, 1918. Discussion of J. E. Howard's paper.

Why Busy Rails Do Not Rust (85832 N). Oliver P. Watts. 2500 w. Am El-Chem Soc—April-May, 1918. Experimental investigations.

The Internal Strains in Steel Rails (84233 N). James E. Howard, with discussion. 25 pp. N E Rd Cb, Pro—Jan. 8, 1918. Investigations, and information concerning strains rails must sustain.

Mill Inspections of Rail in 1915 and 1916 (82167 N). M. H. Wickhorst. 2000 w. Am Ry Eng Assn, Bul—Sept., 1917. Reports results of inspections, and discusses the specifications.

Rail Failure Statistics for 1916 (82168 N). M. H. Wickhorst. 30 pp. Am Ry Eng Assn, Bul—Sept., 1917. Statistics for the United States and Canada for year ending Oct. 31, 1917.

Transverse Fissures in Steel Rails (82498 D). James E. Howard. 12 pp. A I M E, Bul—Nov., 1917. Causes of transverse fissures, or fatigue fractures.

The Shortage of 10,000,000 Tons of Rails (83210 A). C. W. Gennet, Jr. 1000 w. Iron Age—Dec. 27, 1917. Statistics indicating too little rail renewal.

Common Defects in Rail (89301). From paper by C. W. Gennet, Jr., before Roadmaster's Convention. 3000 w. Ry Rev—Oct. 5, 1918. Best avoided by care in manufacture and rigid inspection.

Intensity of Pressure on Rails (85023 C). Appendix H. Ills. 48 pp. Am Ry Eng Assn, Bul—Jan., 1918. Report on rational relation between intensity of pressure due to wheel loads and resistance of rail steel to crushing.

Report of Committee IV—On Rail (85021 C). 17 pp. Am Ry Eng Assn, Bul—Jan., 1918. Report and appendices.

Railway Extensions

Laying the Rails for Future Business (86050). Francis H. Sisson. 5000 w. Am Mach—May 2, 1918. Extracts from address by the vice-president of the Guaranty Trust Co. of New York before the annual meeting of the Chamber of Commerce of the United States.

Reconstruction

Interesting Reconstruction Work on the Erie (88099). Ills. 2500 w. Ry Age—Aug. 9, 1918. A 35-mile section of double track line in Indiana.

Relocation

Illinois Central Raises Line Above Flood Level (82725). Ills. 1500 w. Eng News-Rec—Nov. 29, 1917. Elevation of line near Vicksburg, Miss.

Repair Shops

A Well Organized Repair Shop (86962 A). Ills. 6000 w. Ry Mech Engr—June, 1918. Study of methods of repairing locomotives on the N. Y. C. at West Albany.

Expedite Locomotive Repairs (86970 A). George W. Armstrong. 2200 w. Ry Mech Engr—June, 1918. A well knit organization, and adequate tools and facilities are necessary.

Reclamation on the Southern Pacific (87434 A). Frank A. Stanley. Ills. 1800 w. Ry Mech Engr—July, 1918. Serial, 1st part. Extensive salvage work.

Chilean Railroad Shops of American Design (87615 A). Walter W. Nowak. Ills. 2500 w. Iron Age—July 18, 1918. Represent the best American practice.

The Locomotive Repair Shop Situation (85445). 2500 w. Ry Age—April 5, 1918. Railways need increased facilities.

PERMANENT WAY AND BUILDINGS

Terminals

Roadway

Report of Committee I—On Roadway (85020 C). 5 pp. Am Ry Eng Assn, Bul—Jan., 1918. Best method of draining, etc.

Scrap

Conserve and Reclaim Material (86968 A). 1200 w. Ry Mech Engr—June, 1918. From a circular letter issued by C. H. Markham, to all railroads under his charge.

Shops

New Grand Trunk Car Shops at Port Huron (86630). Ills. 2000 w. Ry Age—May 31, 1918. Detailed description of plant where special attention was given to arrangement.

Car Building Plants and Railroad Repair Shops (84789). 1200 w. Ry Age—March 8, 1918. Interesting figures from Census Report.

Shop Scheduling

Shop Scheduling on the B. R. & P. (85666 A). Ills. 1200 w. Ry Mech Engr—April, 1918. Output increased, and supervision reduced.

Snow Sheds

Concrete Snow Sheds on the Union Pacific (83243). Ills. 4000 w. Ry Age Gaz—Dec. 28, 1917. A new form of protection from drifting snow.

Snow Shed Construction in the Cascades (83027). Ills. 2500 w. Ry Age Gaz—Dec. 14, 1917. New protection on the Great Northern. Types of sheds, design, location, etc.

Telescope Sections for Latest Timber Snowsheds (83457). Ills. 1000 w. Eng News-Rec—Jan. 3, 1918. Features developed by Southern Pacific Co. in Sierra Nevadas.

Spikes

Pennsylvania System Rejects Screw Spikes (84159). Ills. 5500 w. Ry Age—Feb. 8, 1918. Action taken after exhaustive experiments at two points for eight years.

Stations

Toronto Union Station An Imposing Structure (89466). Ills. 1000 w. Can Engr—Oct. 10, 1918. Most important building of the kind in Canada. Will be ready for use next spring.

Structures

Report of Committee XV—On Iron and Steel Structures (85030 C). Ills. 84 pp. Am Ry Eng Assn, Bul—Feb., 1918. Methods of protection against corrosion; types, floors, water-proofing tests, specifications, etc.

Switches

Low Voltage Switch Machines Facilitate Traffic (86628). G. S. Pfisterer.

Ills. 1200 w. Ry Age—May 31, 1918. How electrically operated switches help train movements in mountain country.

Application of Low Voltage Switch Movements (86941). G. S. Pfisterer. Ills. 1500 w. Ry Sig Engr—June, 1918. In connection with the progress made in signaling in a period of ten years on the N., C. & St. L.

Switch Yards

Power for Switch Yards (85985). Ills. 3000 w. Pwr Pt Eng—May 1, 1918. Hot water reclamation equipment and sand drying and transmission system features of new Clyde, Ill., yards of C. B. & Q. R. R.

Tests

Screw-Spike and Tie-Plate Test, Pennsylvania Railroad System (83275 N). W. C. Cushing. Ills. 253 pp. Am Ry Eng Assn, Bul—Oct., 1917. Laboratory and track service tests.

Terminals

Preparation for Winter on a Busy Terminal (89391). F. L. Wells. 1500 w. Ry Sig Engr—Oct., 1918. Advance preparations and methods of handling the work.

Unification of Terminal Facilities in the West (89262). 2500 w. Ry Age—Oct. 4, 1918. Changes in operation to prevent congestion.

Unified Operation of Railroad Terminals (89169). 3000 w. Ry Age—Sept. 27, 1918. Abstract of preliminary report of Am. Ry. Engng. Assn. Fundamental principles.

Some Features of Construction of the St. Paul Union Depot (89213 A). Ills. 2000 w. Af Eng Soc's Minn, Bul—Sept., 1918. Items involved in connection with this new passenger terminal, such as track changes, retaining walls, bridges, tunnels, train sheds, etc.

Engineering of the St. Paul Passenger Terminal (89679). Ills. 2000 w. Ry Rev—Oct. 26, 1918. New station; elevated tracks eliminating grade crossings; coach yard and locomotive terminal.

Unit Operation of Railroad Terminals (89207). 5000 w. Ry Rev—Sept. 28, 1918. Recommendations of the A. R. E. A. committee as to unit operation in large cities.

Urges Study of Unit Operation of Railroad Terminals in Large Cities (89249 A). 5000 w. Eng News-Rec—Oct. 3, 1918. Recommends investigation by representative committees.

The Terminal Question (85605). H. J. Pfeifer. 15 pp. St L Ry Cb, Pro—March 8, 1918. Explains the activities

Terminals

PERMANENT WAY AND BUILDINGS

Track

of the Terminal Railroad Assn. of St. Louis.

The Railway Terminal Problem (85-613). John F. Wallace and Edward J. Noonan. 3500 w. Ry Rev—April 13, 1918. Read at Chicago meeting of U. S. Chamber of Commerce. Arrangements of terminals in cities.

New York Central Opens Cleveland Freight Terminal (87629). Ills. 3500 w. Ry Age—July 19, 1918. Details of L. C. L. station costing more than \$4,000,000.

Speeding Up the Operation of Terminals (86057). M. E. Burk. 2500 w. Ry Age—May 3, 1918. Suggestions for increasing the output of transportation.

The Wabash-Pittsburgh Terminal Investigation (84271). 5000 w. Ry Age—Feb. 15, 1918. Excerpts from report of the Interstate Commerce Commission.

Strassbahn-Depot auf dem "Dreisplatz" in Basel (86465 B). Ills. 1100 w. Schweizerische Bauzeitung—Apr. 6, 1918. New terminals and car barns for tramway in Basle, Switzerland.

Construction Program Is Developed for Union Station at St. Paul (87016). Ills. 1200 w. Eng News-Rec—June 20, 1918. Seven constructive stages for this immense work planned. Work to be finished in 1922.

New Shops and Engine Terminals, Buffalo, Rochester & Pittsburgh Ry. (87169). Ills. 1200 w. Ry Rev—June 22, 1918. Describes improvements and facilities for requirements of the road's large Mallet type engines.

Establishing the Railway Terminal at Camp Dix (82585). W. F. Rench. Ills. 1500 w. Eng News-Rec—Nov. 22, 1917. Design and construction methods different from ordinary practice.

Problem of Freight Terminals for Railroads in Large Cities (82304). Hunter M. Merriwether. 2500 w. Mfrs' Rec—Nov. 8, 1917. A study of terminal enterprises.

Terminal Developments at Vancouver, B. C. (82601). Ills. 2500 w. Ry Age Gaz—Nov. 23, 1917. The Northern Pacific-Great Northern station.

Elevated Terminal Connection at Kansas City (84785). Ills. 3000 w. Ry Age—March 8, 1918. A long two-track steel viaduct and a heavy double-deck bridge of unique design.

A Union Package Freight Terminal at Jersey City (84649). Map. 2200 w. Ry Age—March 1, 1918. Plan for handling of L. C. L. freight at New York to reduce congestion and expedite movement.

New York Central Builds \$4,000,000 High-Level Freight Terminal at Cleveland (84920). W. E. Phelps. Ills. 5500 w. Eng News-Rec—March 14, 1918. Plant almost completed has separate inbound and outbound houses.

Report Committee XIV—On Yards and Terminals (85017 C). 34 pp. Am Ry Eng Assn, Bul—Jan., 1918. Nineteenth annual report.

Tie Tamper

"All in the Service" (86547 A). W. H. Armstrong. Ills. 2000 w. Ry Cb Pitts, Pro—Apr. 26, 1918. A mechanical device known as the Imperial Pneumatic Tie Tamper is described and results given.

A Description of, and the Efficiency of the Imperial Tie Tampers (87022 A). George W. Vaughan. Ills. 30 pp. N Y Rd Cb, Pro—May 17, 1918. A machine developed and in use on the New York Central.

Ties

Present Aspect of the Tie Situation (89209). From remarks by John Foley at Roadmasters' convention. 1800 w. Ry Rev—Oct. 5, 1918. Principles governing the buying and specification of cross ties and difficulties of price fixing.

Report of Committee III—On Ties (85019 C). Ills. 35 pp. Am Ry Eng Assn, Bul—Jan., 1918. Methods of controlling tie renewals, etc.

Tool Room

The Railway Shop Tool Room (86969 A). M. H. Williams. Ills. 6000 w. Ry Mech Engr—June, 1918. An important department, its efficiency affecting the entire plant.

Tool Repairs

Repairing Locomotive Fittings (89420 A). Frank A. Stanley. Ills. 800 w. Am Mach—Oct. 10, 1918. Different styles of reamers for use on locomotive fittings.

Tool Rooms

The Many Advantages of a Manufacturing Tool Room to a Modern Railroad Shop (84169 A). J. H. Painter, with discussion. Ills. 8 pp. S & S W Ry Cb, Pro—Jan., 1918.

Track

A Scientific Study of Railway Track Under Load (84443). Ills. 4000 w. Ry Age—Feb. 22, 1918. Progress report on investigations and tests extending over five years.

Report of Committee V—On Track (84475 N). Ills. 21 pp. A R E A, Bul—Dec., 1917.

Track Work for United States Army in France (82737). Ills. 1500 w. Ry

Track**PERMANENT WAY AND BUILDINGS****Yards**

Age Gaz—Nov. 30, 1917. Designs of frogs, switches and crossings prepared to meet special conditions.

Track Circuits

Track Circuiting of Railways (84559 N). H. Cowan. 13 pp. Per-Way Instn, J1—Dec., 1917. The essential features of track circuits; effect of water, precautions during repairs, etc.

The Maximum Regulating Resistance and Maximum Shunt Resistance of Track Circuits (86713 A). W. J. Thorngood. Read before the Instn. of Ry. Sig. Engrs. 3500 w. Ry Engr—May, 1918. Serial, 1st part. Points of importance in designing or laying out a track circuit. Resistance of steel rails, bond wires, etc.

Track Elevation

Illinois Central Rebuilds Early Track Elevation (87801). C. C. Westfall. Ills. 2500 w. Ry Age—July 26, 1918. Street subways constructed in 1893 are being rebuilt under heavy traffic.

Track Elevation Work of the P. C. C. & St. L. Ry. in Cincinnati (83706). Ills. 1000 w. Ry Rev—Jan. 19, 1918. Details of construction.

Track Maintenance

L'Entretien Des Voies De Chemins De Fer (89722 E). M. A. Moutier. Ills. 1600 w. Soc Ingénieurs Civils De France—April-June, 1918. Maintenance of railway track.

Tracks

Second Track Construction on Southern Railway (82327). Ills. 7000 w. Ry Age Gaz—Nov. 9, 1917. Additional facilities to meet increased traffic improvements in grades and curves.

Completing the Double Track on the Union Pacific (87220). Ills. 3000 w. Ry Age—June 28, 1918. The heavy traffic made necessary the construction of 96 miles of second main line during 1917. Details of the work.

Action of Railway Track Studied by Tests of Depression and Rail Stress (84926). Ills. 3500 w. Eng News-Rec—March 14, 1918. Rigid construction and thorough tamping reduce rail stress.

New Machines Facilitate Track Maintenance Work (84922). Ills. 1200 w. Eng News-Rec—March 14, 1918. Apparatus to increase efficiency and economy on track upkeep.

Progress Report on Stresses in Track (85033 C). Ills. 184 pp. Am Ry Eng Assn, Bul—March, 1918. Tests and results.

Resilient Chairs and Ferro-Concrete Sleepers (84841 A). Ills. 3000 w.

Engng—Feb. 22, 1918. Details of design of an effective concrete sleeper, as shown in sleeper adopted on East Indian Railway.

Track Scales

Minnesota Track Scale Specifications and Tolerances (86053). Ills. 2500 w. Ry Age—May 3, 1918. Rules adopted by the state railroad and warehouse commission.

Baltimore & Ohio Weighing Bureau (84969). L. D. Davis. 1300 w. Ry Age—March 15, 1918. Design and installation of track scales, their proper care and maintenance.

Track Stresses

See same heading under CIVIL ENGINEERING, *Measurement*.

Track Work

Labor Saving Appliances in Rail Renewing on the Chicago, Burlington & Quincy Railroad (88295). Ills. 1200 w. Ry Rev—Aug. 17, 1918. Describes a sawing machine, and rail drilling machine used.

Turntables

Construction, Care and Maintenance of Turntables (88123 A). Ills. 2200 w. Ry & Loc Eng—Aug., 1918. Causes of trouble and remedies.

60-Ft. Locomotive Turntable at Newhaven (84676 A). Ills. & Plate. 300 w. Engr—Feb. 1, 1918. Novel features in design.

Electrically-Operated Locomotive Turntable (82141 A). Ills. 800 w. Engng—Oct. 12, 1917. Construction and operation.

Waterloo Station

Waterloo Station (88420). 1100 w. Times Engng Supp—July, 1918. Progress of improvements recently started in this great London railway terminal.

Weighbridge

Plate Fulcrum Track Weighbridge (85416 A). Ills. 1500 w. Engng—March 8, 1918. A railway weighing machine for the Pennsylvania R. R.

Workshops

Locomotive Workshops at Eveleigh, N. S. W. (89520 N). Ills. 2200 w. Comwh Engr—Sept., 1918. Serial, 1st part. Detailed description of shops and equipment.

Yards

15000-Car Hump Yard Near Chicago Planned by Illinois Central Railroad (88246 A). Ills. 2500 w. Eng News-Rec—Aug. 15, 1918. Terminal for mainline trains, from which transfer trains will serve local yards. Details of operation.

Africa

ROADS AND PROJECTS

Construction

Pennsylvania Builds Large Gravity Yard at Indianapolis (84925). Ills. 1500 w. Eng News-Rec—March 14, 1918. Development at Hawthorne designed for immediate capacity of 3500 cars and ultimate capacity of 10,000 cars.

Y. & M. V. Improvements

Improvements on the Yazoo & Mississippi Valley (85330). Ills. 1700 w. Ry Age—March 29, 1918. Track grades on 44 miles of line near Wicksburg, have been raised to protect against floods.

ROADS AND PROJECTS

Africa

Railways in South-West African Protectorate (83200 A). 4500 w. Ry Engr—Dec. 1917. Abstract from annual report on S. African railways and harbors.

Alaska

Government Railroad Building in Alaska (88114). William C. Edes. 3000 w. Ry Rev—Aug. 10, 1918. Review of the enterprises and general history of the work. Address to Pacific Coast Ry. Co. Railroad Construction Progress in Alaska (89297). Ills. 1500 w. Ry Rev—Oct. 5, 1918. Serial, 1st part. Account of construction of the government railroad between Anchorage and Seward.

The Government Railroad of Alaska (83318). Theodore Pilger. Ills. & Map. 5000 w. Min & Sci Pr—Dec. 29, 1917. First American railroad built and owned by United States government. Details of development.

Australia

The Australian Transcontinental Railway (82377 A). Map & Ills. 1000 w. Engr—Oct. 26, 1917. Account of this recently completed line between Kalgoorlie and Port Augusta.

The Trans-Australian Railway (88-289 A). Map. 2500 w. Engr—July 19, 1918. Serial, 1st part. Information from a souvenir volume prepared for the opening ceremony on Nov. 12, 1917.

The Trans-Continental Railway of Australia (84030). Map and Ills. 2500 w. Ry Age—Feb. 1, 1918. Difficulties in constructing the Kalgoorlie-Port Augusta railway.

The Australian Trans-Continental Railway from Port Augusta to Kalgoorlie (83755 A). E. A. Box. Ills. 3000 w. Engng—Dec. 28, 1917. History of a great undertaking accomplished under many difficulties.

Un Nouveau Chemin De Fer Transcontinental (85141 B). C. Maillard. Ills. 2200 w. Revue Générale des Sciences—Feb. 15, 1918. The projected transcontinental route from Melbourne to Perth, in West Australia.

Baghdad Ry.

The Baghdad Railway and Its Part in the War (83816). Map. 2500 w. Ry Age—Jan. 25, 1918. Mesopotamia campaign has hindered the completion.

Brazil

The Development of the Brazilian Railways (89599). Ills. 2000 w. Ry Age—Oct. 18, 1918. Information from a report on the railways of Brazil.

Cape-to-Cairo

L'État Actuel Des Routes Du Cap Au Caire (87127 B). C. Rabot. Ills. 1800 w. La Nature—May 11, 1918. Present status of Cape-to-Cairo railway line.

China

British Engineering Enterprise and Chinese Railways (88395 A). 3300 w. Engng—July 26, 1918. Deals with the Chinese Government Railways, built with British money.

The Economics of the Chinese Railways (84283 A). Map and Ills. 2500 w. Engng—Jan. 25, 1918. Serial, 1st part. Effect of the war on railway construction and the development of China.

China's Greatest Need Today Is Transportation (85333). Ills. and Map. 3500 w. Ry Age—March 29, 1918. Has only 6,000 miles of railway and practically no good roads.

China and Japan

The Chinese and Japanese Railways Compared (87222). Frank Rhea. Ills. 2000 w. Ry Age—June 28, 1918. Japan's lines have a semi-military organization. Chinese have not control of their railways.

Connecting Railroad

11,000-Volt Overhead on the New York Connecting Railroad (86638). Ills. 2000 w. Elec Ry J1—June 1, 1918. Everything ready for electric operation. Details of telephone and telegraph conduit construction.

Construction

Railway Construction and Operation in the Fighting Zone of France (83679). Extract from lecture by Leslie F. Van Hagan. 1800 w. Eng & Con—Jan. 16, 1918. Describes work of American and

Foreign Railways

Canadian railway regiments in handling troops and supplies at the front.

Railway Construction as Affected by the War (85449). 1800 w. Ry Age—April 5, 1918. Review of the situation.

Foreign Railways

New Railways in Foreign Lands (85219). 2500 w. Ry Rev—March 23, 1918. Résumé of railway enterprises now under way in various parts of the world.

France

Comment Exploiter Au Mieux Les Voies Ferrées? (85144 B). J. Carlier. 2100 w. Le Génie Civil—Mar. 2, 1918. Suggestions for much needed development of French railways.

Les Voies De Communication Directes Entre France Et Italie (83902 B). Ills. 1200 w. La Nature—Nov. 24, 1917. Railways and highways between France and Italy. Characteristics and advantages of each.

Projet D'Une Deuxième Ligne De Chemin De Fer (86495 E). E. Evers. Ills. 4000 w. Mem Soc Ingénieurs Civils De France—Oct.-Dec., 1917. Project of a second railway from Havre to Paris, involving a tunnel under the Seine.

French Lines

Restauration Des Chemins De Fer Après La Guerre (89085 B). H. Morissat. Ills. 2000 w. La Nature—Sept. 7, 1918.

Korea

The Japanese Operated Railroads of Korea (84788). Map and Ills. 4000 w. Ry Age—March 8, 1918. Over 1000 miles of railway constructed in Korea in less than twenty years.

Kentucky

The B. & O. Completes the Long Fork Railway (89425). A. C. Clark. Ills. 800 w. Ry Age—Oct. 11, 1918. An important line in the development of the coal resources of eastern Kentucky.

Mexico

The Serious Condition of the Railways in Mexico (88250). 2500 w. Ry Age—Aug. 16, 1918. Report of Latin-American Division of Bureau of Foreign and Domestic Commerce. Conditions changing rapidly and some reconstruction work in progress.

New Construction

New Railway Construction in Foreign Countries (83464 A). P. Harvey Middleton. 5000 w. Ry Age—Jan. 4, 1918. (Special No.) Projects in South America, Asia, and Africa.

Construction Activities During the Year (83466 A). Ills. & Curves. 8 pp.

ROADS AND PROJECTS**Sind-Pishin Ry.**

Ry Age—Jan. 4, 1918. (Special No.) Total mileage of new lines completed in 1917 compares favorably with the two preceding years.

New Line

The Mansfield Railway (82838 A). Ills. 1500 w. Engr—Nov. 9, 1917. Details of a line in England constructed mainly to serve large collieries.

Ostia

See same heading under CIVIL ENGINEERING, *Waterways and Harbors*.

P. R. R.

The New Pennsylvania Entrance Into Indianapolis (83814). Ills. 2500 w. Ry Age—Jan. 25, 1918. Line between Ben Davis and Frankfort, in Indiana, gives complete line between Indianapolis and Chicago.

Paris-Havre

Paris-Le Havre (89719 B). L. De Launay. Ills. 1800 w. La Nature—Sept. 21, 1918. Railway communication, and project for double tracking existing lines.

Rapid Work

Building a Seven-Mile Railroad in 32 Days' Time (86626). Ills. 1500 w. Ry Age—May 31, 1918. A short spur built in Tennessee for government service.

Russia

Russian Railroads as They Are (87482). Joseph E. Greiner. 1500 w. Mfrs Rec—July 11, 1918. Detailed description.

The American Railway Commission and Russian Railroads (87620). J. E. Greiner. 2000 w. Eng & Con—July 17, 1918. Abstract of address before Engrs' Cb. of Baltimore describing conditions, and giving chief recommendations.

Santa Fé

Efficiency on the Atchison, Topeka and Santa Fé (84078 A). Ills. 3000 w. Ry & Loc Eng—Feb., 1918. Advantages of using oil fuel; details of construction and repair of oil-burning appliances.

Siberia

Railway Systems of Siberia (85768). W. G. Mitchell, in *Russia*. An abstract. Ills. 4000 w. Ry Rev—April 20, 1918. Details of construction, maintenance and operation of this vast system.

Sind-Pishin Ry.

"A Free Route to Persia and Afghanistan" (84976). Map. 5000 w. Ry Age—March 15, 1918. Abstract from E. A. Pratt's "Rise of Rail Power in War and Conquest." How England built her Sind-Pishin Ry. to protect the Indian frontier.

TRAFFIC

Freight House

U. S. Railroads

The Immediate Needs of the Railroads (87807 A). 2500 w. Eng News-Rec—July 25, 1918. Improvements needed to avoid congestion next winter.

Valuation

I. C. C. Report on Valuation of Texas

Midland (88517). 600 w. Ry Age—Aug. 30, 1918. Renders decision on carrier's objections to tentative finding.

Virginian Ry.

The Virginian Railway (82142 A). Map & Ills. 2000 w. Engr—Oct. 12, 1917. Detailed description.

TRAFFIC

Atlantic Ports

Traffic Conditions at Eastern Ports (89680). 2500 w. Ry Rev—Oct. 26, 1918. Survey of operations at Atlantic ports encouraging.

Car Interchange

A Study of the Car Interchange Situation (82208). Samuel G. Thomson. 5500 w. Ry Age Gaz—Nov. 2, 1917. Empty mileage and proper maintenance important factors in distribution plan.

Car Loading

Pennsylvania Lines Specialize in Car Conservation (83818). 2500 w. Ry Age—Jan. 25, 1918. Excellent results from intensive loading.

Car Shortage

Car Shortage, Its Present Condition and Its Remedy (84229). Charles M. Upham, before Richmond meeting of Am. Assn. of State Highway Officials. 3000 w. Br Rds & Sts—Feb., 1918. Steps that have been taken to improve car shortage and the importance of improving highways.

The Car Conservation Problem Solved in China (84157). John Earl Baker. Ills. 1500 w. Ry Age—Feb. 8, 1918. How results are secured.

Coal Movement

Director General McAdoo Speeds Up Coal Movement (83542). Ills. 1500 w. Ry Age—Jan. 10, 1918. Complications of the fuel problem.

Commerce Commission

The Commerce Commission's Annual Report (82867). With editorial. 6500 w. Ry Age Gaz—Dec. 7, 1917. Review of its activities during the year about to close.

Congestion

Congestion Causes Alarming Conditions (82735 A). 2000 w. Iron Age—Nov. 29, 1917. Desperate conditions in eastern United States, and plan recommended for relief.

Demurrage

How to Prevent Freight Car Demurrage (85848 A). Dwight T. Farnham. Ills. 2500 w. Ind Man—May, 1918. Standard practice instructions for loading and unloading cars to facilitate movement.

Efficiency

Non-Essential Transportation May Be Curtailed (82596). 3500 w. Ry Age Gaz—Nov. 23, 1917. Ways of increasing railroad efficiency.

Express

The American Railway Express Company (89557). E. A. Stedman. 2000 w. Ry Rev—Oct. 12, 1918. Outlines Government's scheme of organization for handling express business during the war.

Four Express Companies to Be Consolidated (86739). 6000 w. Ry Age—June 7, 1918. Combination of the four principal companies.

Freight

Train-Lot Plan of Moving Freight in West (86524). 2200 w. Ry Age—May 24, 1918. Operating economies by new method of handling traffic.

Freight Transportation Without Re-handling (89481). Ills. 900 w. Elec Ry JI—Oct. 12, 1918. The Bonner rail wagon system and how it operates.

Report on Proposed Store Door Freight Delivery in New York City (87535). 5000 w. Ry Rev—July 13, 1918. Report of James S. Harlan recommending the discontinuance of free time in removing less than carload freight.

Regulations for Reconsignment of Carload Freight (85577). 4500 w. Ry Age—April 12, 1918. New rules covering all reasonable demands.

Freight Handling

Freight Handling at the Panama Canal (83558 A). Ills. 1500 w. Int Mar Eng—Jan., 1918. Introduction of storage—battery trucks.

Handling Freight Faster with Fewer Men (82871). F. C. Myers. 3000 w. Ry Age Gaz—Dec. 7, 1917. Advantages of electric trucks.

Freight Houses

New Freight House for the Illinois Central R. R. at Champaign, Ill. (84316). Ills. 1100 w. Ry Rev—Feb. 16, 1918. Detailed description of building for the Illinois Central R. R.

New Freight Terminal of P. C. C. & St. L. Ry., at Indianapolis (84317). Ills.

Freight Loading

1000 w. Ry Rev—Feb. 16, 1918. Track elevation and freight house construction data.

Freight Loading

Education in Freight Loading by Means of Photographs (82329). Martin P. Kennedy. Ills. 800 w. Ry Age Gaz—Nov. 9, 1917. Notes on damaged freight and the causes.

France

French Railroads Must Have Higher Freight Rates (82872). 3500 w. Ry Age Gaz—Dec. 7, 1917. Serious deficits. Fifteen per cent advances proposed.

Government Control

Meeting of the National Industrial Traffic League (88644). 3000 w. Ry Age—Sept. 6, 1918. How the large shippers feel toward the new management of the railroads.

Loading

Methods of Locating Lumber in Open Top Cars (83682). Ills. 1000 w. Ry Age—Jan. 18, 1918. Serious waste of equipment and labor due to failure to prevent shifting of lading.

Material Handling

Rushing Material for the Mechanical Department (83180). 1500 w. Ry Rev—Dec. 22, 1917. Duties of the rush clerk.

Ore Transportation

All Forces United in Moving Lake Ore (83434 D). F. L. Prentiss. Ills. 1800 w. Iron Age—Jan. 3, 1918. (Specila No.) Change in methods due to war necessities.

Package Freight

Conveyor Scheme for Handling New York City's Package Freight (88645). Ills. 1000 w. Ry Age—Sept. 6, 1918. Abstract of paper by M. A. Long outlining a plan for constructing three tunnels under the Hudson river for vehicular traffic with conveyors on each side of each tube to transport l. c. l. freight.

The Preparation and Handling of Package Freight (86055). A. C. Kenly. 1100 w. Ry Age—May 3, 1918. Illustrations from the diary of a freight inspector.

Increase in Rates in New England Allowed (86059). 5000 w. Ry Age—May 3, 1918. Financial condition reviewed. Higher rates and fares authorized.

Private Car Lines

Private Car Lines to Receive One Cent a Mile (88518). 8000 w. Ry Age—Aug. 30, 1918. Interstate Commerce Commission finds this rate necessary to help compensate for increased cost.

TRAFFIC**Transport****Rates**

Railway Rates (89653 N). R. A. Lehfeldt. 4500 w. So Af Instn Engrs, JI—Sept., 1918. Discussed from an economic point of view.

Proposed Eastern Freight Rate Increase (82330). 5000 w. Ry Age Gaz—Nov. 9, 1917. Notes on damaged freight and the causes.

Proposed Eastern Rate Freight Increase (82330). 5000 w. Ry Age Gaz—Nov. 9, 1917. Hearings before the Interstate Commerce Commission.

Railway Regulation and Control (82474). 4000 w. Ry Age Gaz—Nov. 16, 1917. Hearings at San Francisco before the Newlands Joint Committee on Interstate Commerce. Rigid long and short haul clause urged.

Le Relèvement Général Des Tarifs (87138 B). J. Trévières. 4800 w. Génie Civil—May 18, 1918. Revision of rates on French railways by legislative act of Mar. 31, 1918.

Higher Freight and Passenger Rates Ordered (86627). 5500 w. Ry Age—May 31, 1918. Freight rates increase 25 per cent. and passenger basis will be three cents per mile.

Reconsignment

First Prize in Reconsignment Privilege Contest (82326). R. C. Mulholland. 4000 w. Ry Age Gaz—Nov. 9, 1917. Present abuse of the privilege and reason therefor; suggestions for a new system.

The Reconsignment Privilege (82738). H. W. Johnson. 1500 w. Ry Age Gaz—Nov. 30, 1917. Abuses to which the privilege has been subjected.

Southwest

Organization of the Southwestern Railway Region (88101). 2000 w. Ry Age—Aug. 9, 1918. Economic character of the territory; mileage, equipment, and revenues of the railways.

Traffic League

National Industrial Traffic League (82597). 2500 w. Ry Age Gaz—Nov. 23, 1917. Discussions of demurrage, bills of lading, express rates, etc.

Traffic Service

Position of the Traffic Man in the Present Crisis (88115). F. E. Scott. Read before Pacific Ry. Co. 2200 w. Ry Rev—Aug. 10, 1918. Scope of the work.

Transport

Transport Reform Considerations (89100 A). Granville F. Billbrough. 3500 w. Ir & Cl Trds Rev—Aug. 30, 1918. Serial, 1st part. Aims to indicate lines for securing a more general coöperation and to outline methods which might im-

United Kingdom

prove facilities and secure economies in transportation.

United Kingdom

Coal and Mineral Traffic on the Railways of the United Kingdom (89048 A). H. Kelway-Bamber, with discussion. Abstract of paper before Instn. of Locomotive Engrs. 4500 w. Ir & Cl Trds Rev—Aug. 30, 1918. Compares the relative efficiency of coal-carrying wagons, discussing possible improvements.

MISCELLANY**Women Workers**

Coal and Mineral Traffic on the Railways of the United Kingdom (87553 A). H. Kelway-Bamber. 2500 w. Engr—June 21, 1918. Calls attention to the need of using wagons of the largest possible carrying capacity.

Waybill

Universal Interline Freight Waybill Adopted (85332). 1000 w. Ry Age—March 29, 1918. To be used with or without through rates.

MISCELLANY**British Railways**

The Future of British Railways (83387 A). 2000 w. Engr—Dec. 14, 1917. Serial. 1st part. The difficulties and how they may be met when Government control terminates.

Canada

The Railway's Part in Developing Western Canada (83539). Ills. 4000 w. Ry Age—Jan. 11, 1918. Methods of the Canadian Pacific in attracting settlers.

Contract Forms

Report of Committee XX—On Uniform General Contract Forms (85018 C). 17 pp. Am Ry Eng Assn, Bul—Jan., 1918.

Employees

Making Americans on the Railroad (89423 A). Samuel Rea. Ills. 2500 w. Am Mach—Oct. 10, 1918. Methods and results in fitting foreign-born employees of the Penn. R. R. to become loyal citizens of the United States.

Engineer Corps

The Work of the Army Engineer Corps (82600). Ills. 1500 w. Ry Age Gaz—Nov. 23, 1917. Work of the railway section.

Organization

Report of Committee XII On Rules and Organization (85029 C). 14 pp. Am Ry Eng Assn, Bul—Feb., 1918. Science of organization; bibliography; etc.

Railway Reports

Year's Work of Railway Engineering Committees Reviewed (85093). 3000 w. Eng News-Rec—March 21, 1918. Summary of reports submitted at Chicago meeting of A. R. E. A.

Railway Supplies

American Railway Supplies in Australia (85150). Map and Ills. 5500 w. Ry Age—March 22, 1918. From report of Frank Rhea. Encouraging outlook.

Selling to Railroads Under Government Control (84970). 2200 w. Ry Age—March 16, 1918. Orders placed will be large and changes in standards and methods less than have been feared.

Is the Supply Field Interested in "Free Ports"? (85452). E. S. Swazey. 3000 w. Ry Age—April 5, 1918. Free ports and their activities; dangers, results, etc.

Our Foreign Trade in Railway Supplies (85575). P. Harvey Middleton. 3000 w. Ry Age—April 12, 1918. Information of value to those who aim to supply foreign fields.

The Railway Supply Field—Prospects for 1918 (85451). 1500 w. Ry Age—April 5, 1918. Recent changes in this field.

The World Market for American Railway Supplies (85440). A. Stephens. 5000 w. Ry Age—April 5, 1918. Necessity of preparing for after-the-war business.

Scrap

Scrap Reclamations on the Atchison, Topeka & Santa Fe Ry. (83850). Charles E. Parks. Ills. 2500 w. Ry Rev—Jan. 26, 1918. Serial. 1st part. Résumé of practice in collecting classifying and salvaging waste.

Standardization

Standardization of Forms, Southern Pacific Co. (89681). E. B. Stewart. 3000 w. Ry Rev—Oct. 26, 1918. Systematic revision of stationery items.

Women Workers

The Employment of Women in Railroad Work (82595). Stuart Bready. Ills. 3000 w. Ry Age Gaz—Nov. 23, 1917. Number increasing rapidly. Their duties.

STREET AND ELECTRIC RAILWAYS

Car Equipment

A. C. Railways

Inductive and Electrostatic Troubles Arising from A. C. Railways (82359 A). 2500 w. Elec Rev—Oct. 26, 1917. Interference with telephone and telegraph lines and methods of dealing with the difficulties.

Acceleration

Acceleration of Cars (89507 A). Lynn G. Riley. 1800 w. Elec JI—Oct., 1918. Advantages and limitations of automatic systems of control, and the use of hand control.

Agreements

Recent Settlement Agreements (86856 A). Harlow C. Clark. 11 pp. A E R A—May, 1918. Tracing the trend toward the "Cost of Service" theory in the readjustment of agreements.

Armature Heating

Armature Heating in Traction Motors (88840 A). Dr. L. Adler. Abstract from *Elektro. Zeit.* 2000 w. Elec'n—Aug. 9, 1918. Methods of determining the temperature and the results.

Armatures

Rewinding and Testing Direct-Current Locomotive Armatures (89020). Frank Huskinson. Ills. 2000 w. CI Age—Sept. 19, 1918. Methods and "stunts" resorted to by a practical mine electrician.

Australia

The New South Wales Government Tramways (87632). Ills. 1200 w. Elec Ry JI—July 6, 1918. Brief account of Australia's greatest electric railway system.

Axles

Car Axles—Their Design, Manufacture and Service (84053). Norman Litchfield. Diagrams. 1500 w. Elec Ry JI—Feb. 2, 1918. Serial, 1st part. Estimating fiber stress is considered.

Boston Elevated

Public Control; Guaranteed Dividend; Higher Fare for Rehabilitation (84203). 5500 w. Elec Ry JI—Feb. 9, 1918. Plan recommended by Mass. Pub. Serv. Commission for restoring Boston Elevated Ry.

Boston Subway

Progress on the Boston Subway (83-264). Ills. 1200 w. Ry Rev—Dec. 29, 1917. Data from the annual report of Edmund S. Davis. Features of work on the Dorchester tunnel extension.

Buenos Aires

La Nouvelle Usine Électrique de la Compania Italo-Argentina (85858 B). P. Calfas. Ills. 2800 w. Le Génie Civil—Mar. 16, 1918. New power station at Buenos Aires of the Italo-Argentine Electric Co.

Buffalo-Niagara

Quick Service Between Buffalo and Niagara Falls (88106). Ills. 1200 w. Elec Ry JI—Aug. 10, 1918. Salient features of a high-speed line.

Car Bodies

Steel Car Body Is Well Adapted to Resist Unusual Stresses (86331). Norman Litchfield. 3000 w. Elec Ry JI—May 18, 1918. Form of mechanical structure which with minimum weight will give the required resistance to shock.

Car Bodies Must Be Designed for Economy as Well as Strength (85774). Norman Litchfield. Ills. 3500 w. Elec Ry JI—April 20, 1918. Considers design and construction.

Car Design

Savings Attainable with Present-Day Car Design (85194). Norman Litchfield. Ills. 3500 w. Elec Ry JI—March 16, 1918. How car design affects operating economy.

Street Railway Cars of New Design. General Description. Method of Analysis Applied. Impact Stresses (87082 A). S. G. George and E. W. Rettger. Ills. 3000 w. Corn C E—April, 1918. Designs covering passenger, freight, interurban, and city cars.

Car Equipment

Betterments Available in Car Equipment (85195). C. W. Squier. Ills. 6800 w. Elec Ry JI—March 16, 1918. Where to use newer motors and control, etc.

Service Conditions Determine Car Equipment Characteristics (85772). C. W. Squier. Graphs. 1500 w. Elec Ry JI—April 20, 1918. Traffic data required before choosing motor equipment.

Considerations in the Choice of Car Equipment (84454). C. W. Squier. Diagram. 1800 w. Elec Ry JI—Feb. 23, 1918. How a traffic survey to determine requirements is made.

Layout and Installation of Motor Car Equipments (82806). H. R. Meyer. Ills. 1500 w. Elec JI—Dec., 1917. Conditions to be considered.

Consult Classification of the Index. See page 9.

Crippled Workers

Car Lighting

An Improved System of Lighting Interurban Trolley Cars (84174 A). W. J. Walker. Ills. 2500 w. Gen Elec Rev—Feb., 1918. Details of a motor generator set designed to maintain constant voltage.

Car Maintenance

Better Car Maintenance an Urgent Necessity (85199). M. B. Lambert. 1000 w. Elec Ry JI—March 1, 1918. Suggestions for shop repairs.

Car Operation

Principles of Economical Car Operation (89500 A). F. E. Wynne. 700 w. Elec JI—Oct., 1918. Practices which help to conserve fuel and labor and improve service.

Some Legal Aspects of One-Man Car Operation (84263 A). Alexander Shapiro. 10500 w. A E R A—Jan., 1918. Attitude of commissions toward their use is more favorable.

Car Trucks

Forces Acting Directly or Indirectly Upon the Truck Side Frame (88275). Norman Litchfield. 2500 w. Elec Ry JI—Aug. 17, 1918. Factors which affect side frame design.

Cars

The First Universal Car (89670). Ills. 2000 w. Elec Ry JI—Oct. 26, 1918. Preliminary details and general design of car submitted by War Industries Board to Housing Bureau.

Classifying Passenger Cars for Given Conditions (84458). Norman Litchfield. Ills. 2500 w. Elec Ry JI—Feb. 23, 1918. Six categories of service outlined.

New Cars for the Melbourne, Brunswick, and Coburg Tramways (82369 N). Struan Robertson. Ills. 1000 w. Comwh Engr—Oct. 1, 1917. Details of construction and important features.

Large Capacity Wooden Hopper Car (88687 A). Ills. 1200 w. Ry Mech Engr—Sept., 1918. Details of car for the Norfolk & Western.

How the Pay-As-You-Pass Car Was Developed (83522). Peter Witt. Ills. 2500 w. Elec Ry JI—Jan. 5, 1918. Explains how the present Cleveland car cuts down boarding and alighting time and insures collection of fares. Possibility of further development.

The Front-Entrance, Center-Exit Car and Higher Schedule Speed (83710). Ills. 2500 w. Elec Ry JI—Jan. 19, 1918. Experience in several cities favorable.

Checking Devices

Study of Car Energy Saving at Dubuque (88351). L. E. Gould. Map. 1500 w. Elec Ry JI—Aug. 24, 1918. Tests made

on level and hill lines showing savings obtained by use of meters as checking devices.

Coal Economies

Power Production in War Times (85236). Walter C. Slade. Abstract of address before New England St. Ry. Ch., Boston. 3000 w. Elec Ry JI—March 23, 1918. Problems of coal delivery and station operation.

Coasting

Saving That "Extra Shovelful of Coal" by Increased Coasting (87634). Harry C. Kendall. 2500 w. Elec Ry JI—July 13, 1918. Experiences and results obtained in Denver, by use of coasting recorders.

Columbus, Ohio

Columbus Company's Idea of a Modern Station (84707). Ills. 2500 w. Elec Wld—March 2, 1918. Interesting features; considerable electrical equipment out-doors.

Walnut Plant, Columbus Railway, Power and Light Co. (84717). Ills. 4000 w. Power—March 5, 1918. Features of interest of a plant having a capacity of 31,250 kv.-a.

New Power Source for Columbus (Ohio) Railways (84699). Ills. 2500 w. Elec Ry JI—March 2, 1918. Most of the electrical equipment is out of doors. No reciprocating units.

Congested Traffic

Staggered Hours for 88,000 Washington Employees (85473). John A. Beeler. From report on electric railway situation. 3500 w. Elec Ry JI—April 6, 1918. Proposes new hours for employees in capital city to relieve traffic.

Construction

Electric Railway Construction on the Detroit-Superior Bridge (87850). Ills. 800 w. Elec Ry JI—July 27, 1918. Interesting overhead and track work on the high-level viaduct at Cleveland, Ohio.

Coöperation

Philadelphia Coöperative Plan Extended (88817). 3000 w. Elec Ry JI—Sept. 14, 1918. Success of plan shown by eight years of experience. Several changes made in new plan.

Cost-of-Service

Defects in the Cleveland Plan (88729 A). Andrew Squire. 3000 w. A E R A—Aug., 1918. Faults which eight years of operation under cost-of-service system have developed.

Crippled Workers

The Disabled Soldier in Electric Railway Service (89212). Ills. 2500 w. Elec Ry JI—Sept. 28, 1918. Account of useful work accomplished by one-arm men, blind men, and others.

Freight

Economical Maintenance

Money-Saving Factors in the Maintenance of Special Work (87659). R. C. Cram. Ills. 4000 w. Elec Ry JI—July 20, 1918. Requirements for economic maintenance.

Economies

War Time Economies for Electric Railways (89501 A). Clarence Renshaw. 5000 w. Elec JI—Oct., 1918. Considers the skip-stop system, overlapping lines, train operation, through routes, coasting, etc.

Economy

Economy and the Railway Man (83798 A). R. E. Danforth. 5500 w. AERA—Dec., 1917. Ways in which operating expenses can be kept down without impairing quality of service.

Electric Locomotives

See same heading under RAILWAY ENGINEERING, *Motive Power and Equipment*.

Electric Railways

Prompt Relief Needed by the Electric Railway (89498 A). M. C. Brush. 1200 w. Elec JI—Oct., 1918. Explains seriousness of present situation.

Applying Engineering and Selling Principles to Electric Railway Transportation (83521). J. F. Layng. 23 pp. Elec Ry JI—Jan. 5, 1918. A discussion of the present situation and its connection with the conservation of the nation's resources.

Electrolysis

Electrolysis—Troubles Caused Thereby and Remedies Which May Be Applied (84232 B). Albert F. Ganz. Ills. 33 pp. Stev Indic—Oct., 1917. Damage from stray electric currents and the remedies.

Elevated

Manhattan Elevated Railway Improvements (83269 D). F. W. Gardiner and S. Johannesson. Ills. 193 pp. A S C E, Pro—Dec., 1917. Details of design of the steel structure, foundation work, method of erection, reconstruction of stations, etc. Always without interruption of traffic.

Manhattan Elevated Railway Improvements (85321 D). Ills. 9 pp. A S C E, Pro—March, 1918. Discussion of paper by F. W. Gardiner and S. Johannesson.

Elevated Rys.

Rebuilding an Elevated Railway Under Regular Schedule Traffic (84315). Map. 2500 w. Elec Ry JI—Feb. 16, 1918. More than \$10,000,000 has been spent on Manhattan elevated railways in building 23 miles of express track. Increased traffic capacity and other advantages.

Employees

Labor and the Electric Railways (88546). Britton I. Budd. 2200 w. Elec Ry JI—Aug. 31, 1918. Importance of co-operation and fair pay.

England

Traffic Problems in British Cities (83919). 2000 w. Times Engng Supp—Nov. 30, 1917. Special problems in different cities; traffic density as compared with those in other cities of the world.

Equipment

Railway Equipment Maintenance (86857 A). J. S. Dean. 14 pp. A E R A—May, 1918. Methods in use by leading companies.

Express

Trolley Express Service in a Busy Industrial Community (82228). Ills. 2000 w. Elec Ry JI—Nov. 3, 1917. Reports the profitable service of the Connecticut Co.

Extensions

How Public Service Railway Is Helping Build Ships in Newark Vicinity (89671). Ills. 4000 w. Elec Ry JI—Oct. 26, 1918. New facilities costing more than \$800,000, for hauling war workers.

Fares

How Zone Fares Are Collected (88545). 2500 w. Elec Ry JI—Aug. 31, 1918. Summary of European and American practice showing methods adopted.

France

Construction Des Tramways Electriques Du Saint-Gironnais (82658 C + D). T. Bibès. Ills. 8900 w. Annales Des Ponts Et Chaussées—July-Aug., 1917. Electric railways aggregating 24.5 miles in length at and near St. Girons. Power plant, equipment, etc.

Freight

Freight by Electric Railways (86855 A). F. E. Wynne. 2500 w. A E R A—May, 1918. How it can be extended with the minimum of capital expenditure.

Freight Motive Power Equipment (86639). G. M. Woods. Ills. 1200 w. Elec Ry JI—June 1, 1918. Present equipment is sufficient if freight haulage is confined to off-peak hours.

The Electric Railway—A Potential Factor in Relieving Freight Congestion (89502 A). A. B. Cole. Ills. 1700 w. Elec JI—Oct., 1918. Importance of developing freight haulage.

Electric Railways Are in a Position to Haul More Freight (86198). A. B. Cole. Ills. 30 pp. Elec Ry JI—May 11, 1918. Shows how electric railways can relieve present traffic congestion.

Fuel Saving

Rhode Island Electric Freight Business Increases 185 Per Cent. in Ten Years (86543). Ills. 1500 w. Elec Ry JI—May 25, 1918. Details of less-than-carload freight handling at Providence, R. I.

Fuel Saving

Saving Fuel Through Operating Economies (84202). 3000 w. Elec Ry JI—Feb. 9, 1918. Shows how more than 25,000 tons of coal can be saved yearly on Washington (D. C.) electric railways. Closes control of car operations.

Gear Losses

Will a Cushioned Gear Save Power in Car Operation? (88276). G. W. Remington. 1000 w. Elec Ry JI—Aug. 17, 1918. Energy expended in vibration and shocks is improperly included with the gear losses.

Labor-Saving

Labor-Saving Methods in the Way Department (85198). Roy C. Cram. Ills. 4500 w. Elec Ry JI—March 16, 1918. Analyzes the possibility of utilizing many machines and tools in the up-keep of track.

Lightning Arresters

Protecting Car Equipment Effectively Against Lightning (85775). R. T. Wagner. Ills. 3000 w. Elec Ry JI—April 20, 1918. How best to install and maintain car-type aluminum arresters.

Line Construction

Applying Common-Sense in Line Construction (88273). Charles R. Harte. Ills. 3000 w. Elec Ry JI—Aug. 17, 1918. Money and time can be saved by close co-operation of designer and constructor.

Maintenance

What the Maintenance of Way Department Does (84455). R. C. Cram. 3500 w. Elec Ry JI—Feb. 23, 1918. Improvements suggested.

Railway Equipment Maintenance (83797 A). John S. Dean. 1000 w. AERA—Dec., 1917. Serial, 1st part. The present article deals with organizations.

Melbourne

The Tramways of Melbourne (85884). 1100 w. Times Engng Supp—Mar. 29, 1918. A cable system for the street railways. Extensions contemplated.

Montreal

Power Distribution for the Montreal Tramways (84817). Ills. 1500 w. Elec Ry JI—March 9, 1918. Design considerations in the rehabilitation of the power system.

Six-Motor Multiple-Unit. Trains for Montreal (84689). Keith MacLeod. Ills. 1500 w. Elec Ry JI—March 2, 1918. Features of operation.

Passenger Transportation

Remodeling the Hochelaga (Montreal) Power Plant (86742). Ills. 2200 w. Elec Ry JI—June 8, 1918. Reconstruction to provide increased capacity in the engine room, boiler room and in the control and distributing sections. Electric Railway Power at Montreal (83563). Ills. 2000 w. Elec Ry JI—Jan. 12, 1918. Principal dependence is on hydraulic plants. Explains general plan.

Motor Curves

Current and Power Curves Show Results to Be Expected of Motors (86883). C. W. Squier. 1500 w. Elec Ry JI—June 15, 1918. How current and power input graphs are derived from the speed-time and motor characteristic curves.

Motors

Ventilated Motors During a Strenuous Winter (85196). R. E. Hellmund. Ills. 3000 w. Elec Ry JI—March 16, 1918. Neglected commutator covers of old motors gave more trouble than clogged drain holes of ventilated type.

One-Man Cars

A. E. R. A. War Board Submits Brief on One-Man Cars (88033). 3000 w. Elec Ry JI—Aug. 3, 1918. Favorable report.

Operation

Increased Economy Results from Correct Operation of Car Equipment (88272). C. W. Squier. 1500 w. Elec Ry JI—Aug. 17, 1918. Effects of rate of acceleration and braking on the schedule speeds and power consumed in car operation.

Overhead

Certain Overhead Department Economies (85193). Charles R. Harte. Ills. 3500 w. Elec Ry JI—March 16, 1918. Saving by doing overhead repair work with power equipment.

Overhead System

Catenary Overhead Construction (82,873). W. C. Lancaster. Ills. 5000 w. Elec Ry JI—Dec. 8, 1917. Study of the design of the overhead system of the Montreal tunnel and terminal of the Canadian Northern railroad.

Overhead Structures

Providing Strength and Attractiveness in Special Overhead Supports (87656). Charles R. Harte. Ills. 3000 w. Elec Ry JI—July 20, 1918. Considers overhead bridges and other special structures.

Passenger Transportation

Putting Car Wheels Under Shipbuilders (88032). Ills. 4500 w. Elec Ry JI—Aug. 3, 1918. Service reported adequate in 85 out of 164 shipyards.

Rates

Peak-Load Power

International Railway Installs Steam Turbine in Unique Location (87633). Ills. 1500 w. Elec Ry JI—July 13, 1918. A 5500-kw. second-hand turbine installed for a peak-load power supply.

Power Plants

Electric Railway Power Plant and Its Personnel (84456). Hartley LeH. Smith. 2500 w. Elec Ry JI—Feb. 23, 1918. Need of technical men in the boiler room.

Power Saving

Conserving Men and Material (88730 A). 2500 w. A E R A—Aug., 1918. Recommendations of street railway committee of the New England Fuel Administration. Connecticut Company's Power Saving Campaign (84700). William Arthur. Ills. 3000 w. Elec Ry JI—March 2, 1918. Systematic educational work has reduced energy consumption per car mile by 11 per cent in five months.

Public Control

Service-at-Cost Offered to all Massachusetts Electric Railways (86743). 4000 w. Elec Ry JI—June 8, 1918. Legislature enacts measures providing for public control of Bay State street railway and state directors of other roads accepting service-at-cost plan.

Rail Return

Sur Le Réseau De Retour Des Tramways (85851 D). F. Guery. Ills. 7300 w. Bul Soc Internationale Des Électriciens—Feb., 1918. Calculation of voltage drop in rails; size of feeders required, etc.

Sur Le Retour Du Courant Par Les Rails (83933 D). E. Brylinski and G. Girousse. 12000 w. Bull Soc Internationale Des Électriciens—Nov., 1917. Mathematical treatment of return current in tramway rails. Voltage, location of feeders, etc.

Railway Motors

Proper Analysis is Fundamental in Choosing Railway Motors (86329). C. W. Squier. 2500 w. Elec Ry JI—May 18, 1918. Shows how speed-time graphs are constructed and describes considerations necessary for proper choice of car motors.

Operation of Ventilated Motors Under Snow Conditions (89505 A). R. E. Ferris. Ills. 1800 w. Elec JI—Oct., 1918. Classes and effect of snow, classes of service, etc.

Seeking for the Best Railway Motor (89499 A). B. G. Lamme. 1500 w. Elec JI—Oct., 1918. Study of car efficiency and the service the electric motor must meet.

Single vs. Twin Armature Motors (89509 A). J. M. Labberton. Ills. 1500

w. Elec JI—Oct., 1918. A comparison.

The Application of the Ventilated Railway Motor (89504 A). S. B. Cooper. 1000 w. Elec JI—Oct., 1918. Remarkable reduction in weight and other advantages. Characteristics.

The Twin Armature Motors (89510 A). Gearld F. Smith. Ills. 1500 w. Elec JI—Oct., 1918. Details of motors for the Chicago, Milwaukee, and St. Paul direct-current locomotives.

Dipping and Baking Railway Motors Will Decrease Troubles (86887). J. V. Dobson. Ills. 2500 w. Elec Ry JI—June 15, 1918. Describes the apparatus necessary and the precautions that should be taken.

Railway Problems

Present Day Problems of the Railways (82159 A). L. S. Storrs. 3500 w. A E R A—Oct., 1917. Increased cost of labor and materials demanding increased revenue.

Depreciation and Rate-Making (82-770). 4000 w. Elec Ry JI—Dec. 1, 1917. New England Street Ry Club discusses phases of these topics.

Rail Wear

An Early Experimental Study of Rail Wear (83852). R. C. Cram. Ills. 2500 w. Elec Ry JI—Jan. 26, 1918. First use of electric weld joints, with abstract of paper by A. J. Moxham, read in 1898.

Rapid Transit

Some Features of New York City's New Rapid Transit System (86853 B). Robert Ridgway. Ills. 9500 w. Bos Soc C E, JI—May, 1918. General summary of the programme of rapid transit, with description of interesting features and details of construction and cost.

Rates

Automatic Rate System Is Fair to All (88107). Harold W. Clapp. 2000 w. Elec Ry JI—Aug. 10, 1918. Shows desirability of flexible fares automatically adjusted.

Increased Revenue to Offset Higher Wages (87254). Thomas N. McCarter. 1800 w. Elec Ry JI—June 29, 1918. Considers the power of the federal government to raise rates.

Raise Rates to Permit Higher Wages (87253). Also editorial. 8000 w. Elec Ry JI—June 29, 1918. The effect of the financial condition of electric railways upon determination of rates by the War Labor Board. Opinions of rate experts on the matter.

What Is a Fair Return in War Time? (87635). John Bauer. 2500 w. Elec Ry

Reclamation Work

Jl—July 13, 1918. Rates on new investment must be based on market conditions.

The Status of the Higher Fare (87255). Thomas Conway, Jr. 4000 w. Elec Ry Jl. Review of the movement to secure higher electric fares in the State of New York.

Reclamation Work

Connecticut Company Centralizes Reclamation Work at New Haven (88543). Ills. 2000 w. Elec Ry Jl—Aug. 31, 1918. Economies from reclaiming equipment.

Records

Maintenance Records That Prove Invaluable (85942). 1500 w. Elec Ry Jl—Apr. 27, 1918. Methods of performance of equipment on the Memphis street railway. Tables and graphs show results.

Repairs

Keeping the Track Special Work in Repair (86884). R. C. Cram. 2500 w. Elec Ry Jl—June 15, 1918. The repair and renewal of special work.

Safety Cars

Fort Worth Still Blazes the Trail (89210). Ills. 1500 w. Elec Ry Jl—Sept. 28, 1918. Benefits from the use of safety cars.

Less Fuel, Less Personnel, More Business at Tampa (89211). Ills. 1800 w. Elec Ry Jl—Sept. 28, 1918. Results from service of safety cars.

The Success of the Safety Car (89503 A). G. M. Woods. Ills. 3000 w. Elec Ry Jl—Oct., 1918. Features that contribute to its economical operation.

Safety Devices

Simple Door Signaling and Interlocking Connections (89506 A). A. H. Candee. Ills. 1000 w. Elec Ry Jl—Oct., 1918. General principles and wiring arrangements outlined.

Service

Hauling Shipbuilders to Hog Island—and Home Again (88816). Ills. 2500 w. Elec Ry Jl—Sept. 14, 1918. Problems in transferring 30,000 people each way daily.

High Passenger Density the Outstanding Feature of New Service to Hog Island (88665). Ills. 2500 w. Elec Ry Jl—Sept. 7, 1918. Cars for carrying shipbuilders are described, also the service.

Shops

Electric Car Repair Shops at Torrance, California (84903 A). Carroll R. Harding. Ills. 2500 w. Corn C E—Jan., 1918. Details of new plant and study of design.

Signals

New 60-Cycle Signal Installation on the T. H., I. & E. (82477). Adolph

Steel Supports

Schlesinger. Ills. 3000 w. Elec Ry Jl—Nov. 17, 1917. Details of system on high-speed interurban line in Indiana. "Skip Stop"

History of the "Skip Stop" (86854 A). Alexander Shapiro. 15 pp. A E R A—May, 1918. Serial, 1st part. Its various forms, methods of putting it into effect, etc. Economies and benefits.

Slowdowns

The Time Lost in Slowdowns (88686 A). Walter V. Turner. 2500 w. Ry Mech Engr—Sept., 1918. Compares acceleration with deceleration in steam road service, computing time lost.

Snow Fighting

Some Pointers on Snow-Fighting Equipment and Its Use (82608). P. Ney Wilson. Ills. 2000 w. Elec Ry Jl—Nov. 24, 1917. Lessons taught by recent experiences of the Connecticut company.

Snow

Snow Fighting in Montreal (88544). Arthur Gaboury. 2500 w. Elec Ry Jl—Aug. 31, 1918. How a northern city keeps its streets clear of snow in severe winters, and maintains car service.

Speed

Constant Speed vs. Varying Speed Characteristics for Electric Railway Vehicles (82181). R. E. Hellmund. 3500 w. Elec Ry Jl—Nov., 1917. Shows that in many cases constant speed is superior.

Speed-Time

Effect of Grades and Curves in Plotting Speed-Time Graphs (87657). C. W. Squier. 2000 w. Elec Ry Jl—July 20, 1918. Calculations and methods described.

Springs

Reworking Electric Railway Truck Springs (82566). J. V. Hunter. Ills. 5000 w. Am Mach—Nov. 22, 1917. Methods used in the Middle West.

State Aid

State Aid for Physical Improvements (82874). 3000 w. Elec Ry Jl—Dec. 8, 1917. Suggests rehabilitation through state credit as a means of improving financial results of electric railways.

Stations

Design of Subway and Elevated Stations (83157 B). S. J. Vickers. Ills. 18 pp. Min Engrs' Jl—Nov., 1917. Matters that should receive consideration.

Steel Supports

Virtues and Limitations of steel supports in Overhead Construction (86327).

Street Railway

Charles R. Harte. Ills. 3000 w. Elec Ry JI—May 18, 1918. Types of permanent poles are considered.

Street Railways

The United Railways (86269 A). C. E. Smith. 45 pp. E Cb St L, JI—Mar.-Apr., 1918. Present street railway situation reviewed.

Substations

Automatic Substation of New Type on Ohio Electric (85619). R. J. Wensley. Ills. 1800 w. Elec Ry JI—April 13, 1918. Details of a new type of equipment.

Designing and Operating the Substation for Maximum Efficiency (85618). Ills. 3000 w. Elec Ry JI—April 13, 1918. Details of the Cedar Ave. substation of the Cleveland (Ohio) Railway.

Sous-Station Du Chemin De Fer De Paris A Arpajon (85872 B). L. Pahin. Ills. 1200 w. L'Industrie Electrique—Mar. 25, 1918. Sub-station of the Paris municipal railways at Arpajon. Rotary converters and other equipment.

Savings Effected by Automatic Substations (85617). H. E. Davis. Ills. 1500 w. Elec Ry JI—April 13, 1918. Details of automatic operation of one of four substations on the Oneida line of N. Y. State Railways; analyzing the economies.

A Model Substation for a Chicago Residence District (82606). Ills. 3000 w. Elec Ry JI—Nov. 24, 1917. Features of design in the new Commonwealth Edison substation.

The Operation of Railway Substations Without Attendants (82263 A). W. D. Bearce. Ills. 2000 w. Gen Elec Rev—Nov., 1917. Review of progress during the past three years.

Subways

Construction Problems of the Manhattan-Bronx, and Lexington Avenue Subway Junction and Queensborough Tunnel Connections (82941 D). George Perrine. Ills. 40 pp. A S C E, Pro—Nov., 1917. Connections in the vicinity of 42d St., New York, and extension of Queensborough tunnel.

Subway Tracks

Distribute Subway Track Material by Motor Truck (86042). Ills. 1700 w. Eng News-Rec—May 2, 1918. Methods of track laying in 7th Ave. subway, N. Y. City.

Sweden

On Visiting the Riksgrans Railway (87943 A). H. L. Kirker. Ills. 3500 w. Elec JI—Aug., 1918. Single-phase railway in the Arctic Circle, in Lapland, Northern Sweden.

Track**Switches**

Automatic Track Switches Release Men for Other Work (86608). R. C. Cram. Ills. 4000 w. Elec Ry JI—Oct. 19, 1918. A study of the development and present status of automatic and remote control track switches.

Terminals

Buffalo Division Engine Terminals, Lehigh Valley R. R. (87167). Ills. 2500 w. Ry Rev—June 22, 1918. Improvements introduced in modernizing engine house facilities.

Union Freight Terminal at Kansas City for Interurban Lines (82607). Ills. 1500 w. Elec Ry JI—Nov. 24, 1917. Four roads will use recently opened station.

Testing

The Testing Organization of Electric Railways (85197). Hartley LeH. Smith. Ills. 5500 w. Elec Ry JI—March 16, 1918. Analysis showing the usefulness of such a department.

Three-Wire

Line Drop and Rail Potentials Reduced by Three-Wire System (82333). E. H. Hagensick. Ills. 1200 w. Elec Ry JI—Nov. 10, 1917. Conditions improved in Omaha, Neb., by installation of 3-wire principle.

Third-Rail

Voltage Rises in Third-Rail Circuits (83033). D. D. Ewing. Ills. 1500 w. Elec Ry JI—Dec. 15, 1917. Study of the cause.

Tools

Selecting and Caring for Hand Tools Used by War Department (86330). R. C. Cram. Ills. 5000 w. Elec Ry JI—May 18, 1918. Suggestions for the care, repair and use of tools.

Tower Erection

Some Practical Points in Pole and Tower Erection and Support (88991). Charles R. Harte. Ills. 4500 w. Elec Ry JI—Sept. 21, 1918. Particular reference to erection in marshy ground.

Track

Greater Uniformity in Track Spirals Will Conduce to Economy (85472). E. M. T. Ryder. Ills. 1500 w. Elec Ry JI—April 6, 1918. Desirability of standards, showing that co-operation could bring about great simplification.

Track Construction Methods Employed on Great Street Widening Plan (85340). Ills. 2200 w. Elec Ry JI—March 30, 1918. New type of sub-grade construction; complete rebuilding of double-track of Chicago surface lines.

